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UNITED STATES DEPARTMENT OF AGRICULTURE

DEPARTMENT BULLETIN No. 1412

Washington, D. C. ▼ June, 1926

MARKETING LETTUCE

By

CHARLES W. HAUCK, formerly Marketing Specialist
Division of Fruits and Vegetables
Bureau of Agricultural Economics

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A GROWING INDUSTRY

Commercial production and distribution of lettuce in the United States during recent years has attained the dimensions of an important industry. Lettuce shipments in 1924 filled more than six times as many cars as in 1916. The greatest increase occurred during the five-year period, 1919–1923 inclusive. In 1923 the crop ranked third among all vegetables in point of car lots shipped, being exceeded only by potatoes and cabbage.

The United States Department of Agriculture computed the farm value of lettuce in 1924 at $18,600,000. In that year lettuce ranked fourth in this respect among all vegetables, being exceeded by potatoes, sweet potatoes, and tomatoes. In the case of most of these leading crops a substantial portion is used for canning or in the manufacture of by-products, but this is not true of lettuce. Its entire value is made up of proceeds of sales for table consumption in the fresh form.

Land devoted to commercial lettuce production increased from 16,870 acres in 1918 to 63,060 acres in 1924, an expansion of 274 per cent. The most notable increase took place in the West. Arizona reported 300 acres in 1918 and 4,800 acres in 1924; California, 7,140 acres in 1918 and 32,780 acres in 1924; Colorado, 140 acres in 1918 and 5,600 acres in 1924; and Idaho, practically no commercial acreage at all until 1920 when 80 acres were reported, and 1,420

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acres in 1924. Both Colorado and Idaho reported larger acreages in 1923 than in 1924 and lettuce production may be considered as in a more or less unsettled stage in both States.

The factor chiefly responsible for this increased production and consumption probably is the emphasis placed in recent years on the value of leafy vegetables, especially lettuce, in the diet. Head lettuce has ceased to be considered a luxury and is now a common article of diet in many homes the year round. This widened demand has brought some growers substantial profits, exaggerated stories of which have induced increased plantings and have attracted others to the growing of lettuce. Production has increased until, at present, many growers are finding it difficult and at times impossible to dispose of their crop at a profit.

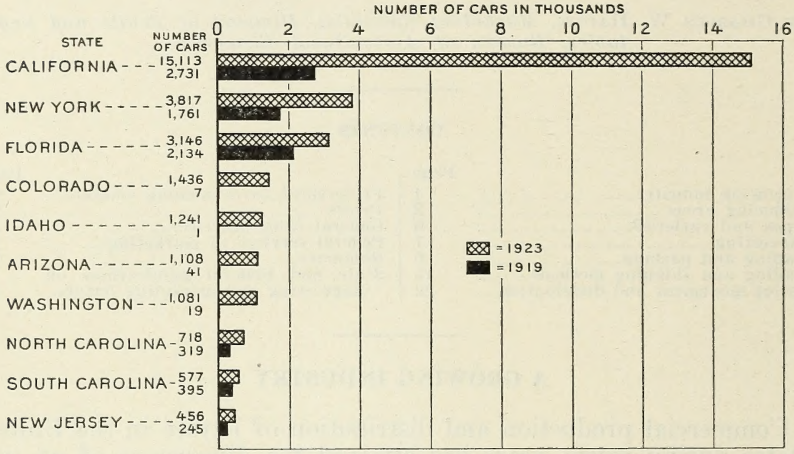

FIG. 1.—Lettuce shipments increased remarkably from 1919 to 1923, when they became fairly stable

PRODUCING AREAS

California, the only State to ship head lettuce the year round, leads all other States in the volume of shipments. In 1924 New York State was second in the number of shipments and Florida third, followed closely by Arizona. The first three States produced nearly 80 per cent of the total car-lot shipments of lettuce in 1924, while more than 97 per cent of the entire tonnage in that year was produced by the 10 States shown in Figure 1. The relative importance of these 10 principal States and the growth of shipments from 1919 to 1923 are shown in this chart. The principal areas devoted to the production of leaf lettuce, most of which is grown under glass, are located near Boston, Mass., Cincinnati, Cleveland, and Ashtabula, Ohio; and Grand Rapids, Mich.

Table 1 shows the commercial acreage, the yield per acre, and the production of lettuce in 10 States from 1919 to 1924, inclusive.

TABLE 1.—*Commercial acreage, yield per acre and production of lettuce in 10 States, 1919–1924*

States	Acreage					
	1919	1920	1921	1922	1923	1924
	Acres	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*
Arizona	270	520	630	1,480	2,900	4,800
California	7,670	17,880	15,340	18,140	24,700	32,780
Colorado	190	730	900	6,000	6,710	5,600
Florida	2,680	3,500	3,060	3,140	3,780	3,490
Idaho	0	80	400	1,800	3,150	1,420
New Jersey	840	980	1,070	1,380	1,310	1,730
New York	4,220	4,690	5,120	6,000	7,150	6,450
North Carolina	540	500	760	1,180	1,230	1,540
South Carolina	780	740	1,340	1,750	1,980	1,310
Washington	220	730	1,080	1,080	2,000	1,400
Total	17,410	30,350	29,700	41,950	54,910	60,520

States	Yield per acre					
	1919	1920	1921	1922	1923	1924
	Crates[1]	*Crates*[1]	*Crates*[1]	*Crates*[1]	*Crates*[1]	*Crates*[1]
Arizona	273	297	287	333	303	263
California	291	301	238	204	264	215
Colorado	274	292	315	210	169	99
Florida	466	470	547	550	360	350
Idaho		268	292	198	161	157
New Jersey	210	208	217	223	213	213
New York	200	230	257	200	217	236
North Carolina	308	308	307	300	260	225
South Carolina	294	266	300	225	145	180
Washington	274	286	437	379	327	263
Average	292	305	288	246	246	217

States	Production (000 omitted)					
	1919	1920	1921	1922	1923	1924
	Crates[1]	*Crates*[1]	*Crates*[1]	*Crates*[1]	*Crates*[1]	*Crates*[1]
Arizona	74	154	181	493	879	1,262
California	2,232	5,382	3,649	3,710	6,519	7,033
Colorado	52	213	284	1,260	1,134	554
Florida	1,249	1,645	1,674	1,727	1,361	1,222
Idaho		21	117	356	507	223
New Jersey	176	204	232	308	279	368
New York	844	1,079	1,316	1,200	1,552	1,522
North Carolina	166	154	233	354	320	346
South Carolina	229	197	402	394	287	236
Washington	60	209	472	409	654	368
Total	5,082	9,258	8,560	10,211	13,492	13,134

[1] Crates of 3 dozen heads each.

ARIZONA

The Phoenix, Tucson, and Yuma sections ship most of the lettuce produced in Arizona. The crop is grown under irrigation exclusively in this State.

CALIFORNIA

The four principal lettuce-producing districts in California are (1) the Imperial Valley, (2) Los Angeles County and adjacent territory, (3) Santa Barbara County, and (4) sections of the State from Salinas and Watsonville northward including the Sacramento Valley.

COLORADO

Approximately nine-tenths of the lettuce grown in Colorado is produced at elevations between 7,000 and 9,000 feet, in a more or less scattered belt extending north and south through the central part of the State.

FLORIDA

Important lettuce-growing sections of Florida are in Manatee County near Palmetto and Bradentown; in Seminole County at Sanford; in Orange County near Winter Garden; and in Alachua and Marion Counties between Micanopy and McIntosh. Other districts in this State ship head lettuce in car lots, but most of the commercial production is confined to the sections named.

IDAHO

The three important lettuce districts of Idaho border the Snake River Valley. On the north in Nez Perce County, known as the Lewiston section; about 100 to 150 miles farther south is the area known as the Boise section, in Ada, Canyon, and Payette Counties; and in the south is the Twin Falls section, in Twin Falls County. The crop is grown generally in small fields of 1 to 5 acres, on land varying in elevation from 2,000 to 5,000 feet.

NEW JERSEY

The principal sources of car-lot shipments in New Jersey are Cumberland, Salem, Gloucester, Monmouth, and Warren Counties. Lettuce is grown in many parts of the State in connection with other truck crops, as market gardening is an important industry.

NEW YORK

Head lettuce is grown for car-lot shipment in New York State principally in Wayne and Oswego Counties, in the Elba section of Genesee and Orleans Counties, and in the Canastota-Chittenango district in Madison County, though a small acreage is to be found here and there throughout other parts of the State. The Long Island and Orange County sections produce lettuce on a rather extensive scale, largely for New York City consumption.

NORTH CAROLINA

Most of the North Carolina lettuce shipments originate along the Atlantic coast in the Wilmington and Beaufort sections, although there is some commercial production in the interior of the State.

SOUTH CAROLINA

Two districts in South Carolina are important in the production of lettuce—Beaufort County and the Charleston section, the latter including Johns Island and the territory adjacent to the city of Charleston.

WASHINGTON

Most of the lettuce grown for commercial purposes in the State of Washington is produced near Puget Sound between Seattle and Tacoma. A small quantity comes from Walla Walla County.

TYPES AND VARIETIES

Lettuce is one of the most varied of our cultivated vegetables. More than 100 distinct varieties are grown in this country, although not more than 10 or 12 of these are important commercially.

With respect to market requirements, these varieties may be classified into two main groups—those which form more or less compact heads, known as head lettuce, and those which do not form heads, known as leaf lettuce. From the standpoint of car-lot distribution, the latter type is relatively unimportant. Although production in some sections is large, leaf lettuce is grown mainly as a greenhouse crop in areas near the large cities, and the greater part of it goes into consumption locally. Shipments are made principally by trucks and express.[1] Most of the leaf lettuce grown in greenhouses is of the Grand Rapids variety.

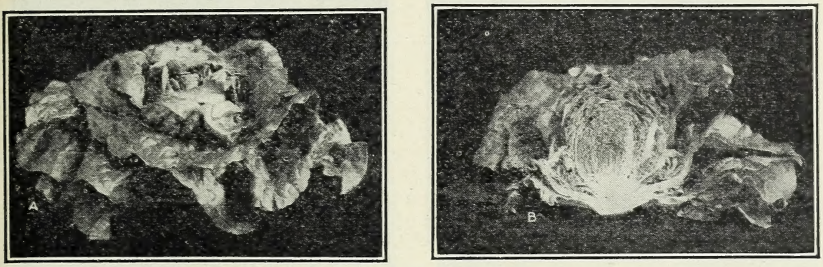

FIG. 2.—Big Boston lettuce

Head lettuce, on the other hand, is a field crop of great commercial importance. The principal varieties included in this group are of the Big Boston and New York types. The latter type includes such varieties as Iceberg, New York, Los Angeles, Wonderful, Hanson, and others, but in commercial transactions little distinction is made between the varieties. In many markets they are all known as Iceberg. Some confusion has developed in recent years from the fact that lettuce growers in southern California call their lettuce "Imperial Valley Iceberg," that Seattle growers call theirs "Washington Iceberg," and that Colorado and Idaho growers call theirs "Mountain Iceberg," and so on. In reality, they are nearly all the New York type. Cos lettuce, or Romaine, is included within the head-lettuce group, although the long slender heads developed by this type are loosely formed.

Big Boston, until recent years, was the most widely known variety under cultivation in the United States. It forms a brittle cabbage head, medium large, and globular in shape (fig. 2). The outer leaves are a medium light-green color, with a slight tinge of brown

[1] For a more complete discussion of greenhouse lettuce see United States Department of Agriculture Farmers' Bulletin No. 1418, Lettuce Growing in Greenhouses, by J. H. Beattie, 1924.

on the margins. The enfolding leaves do not overlap far, so the head is more or less open at the center. The interior of the head is a golden yellow and appears somewhat oily or buttery. The leaves are smooth with a tendency to a bright sheen.

Big Boston is early and hardy and stands shipping well. It is the only variety of importance grown as an open field crop in the Eastern and Southeastern States. Attempts have been made in a few of these districts to grow other varieties, of the Iceberg or New York type, but generally with indifferent success. Climatic conditions during most of the growing season in these sections are not favorable for the development of firm heads of lettuce of the New York type. In the South Central States most of the crop is Big Boston, the remainder Iceberg type.

New York and other varieties of this type are grown almost exclusively in the western lettuce-growing States, although it is possible in most of the important western sections to produce nearly all types with some success. The New York or Los Angeles variety is grown mainly for fall and winter shipments, and Iceberg during the

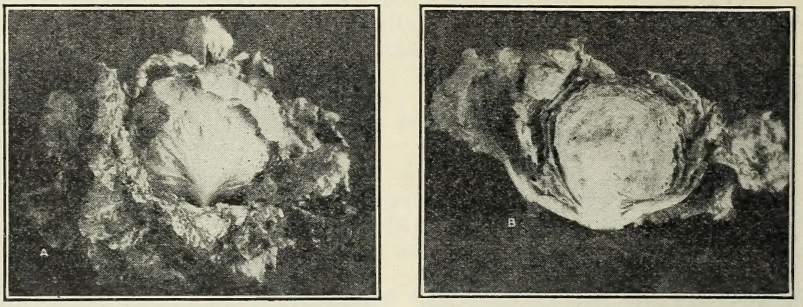

FIG. 3.—New York or Iceberg type lettuce

late spring. A few plantings of Big Boston have been made at times in some of these sections.

The New York variety forms a large, hard, crisp head, which is somewhat flattish-globular in shape when mature (fig. 3). the leaves are dark green and slightly curled on the edges, overlapping well at the crown. The head has a crumpled appearance and is white inside.

Iceberg is similar to New York. The head is medium large and medium green; the leaves wavy, with fringed edges, tinged at the margins with brown.

White Paris Cos is the best known and most popular Cos variety in the United States. The common French and Italian name for this type is "Romaine" and the two names are often used interchangeably in this country. It is distinguished by its upright habit of growth, long loaf-shaped heads, and spatulate leaves. The plant is medium large and of a medium green color. The head is not compact, but is well folded and of good quality (fig. 4).

Grand Rapids is by far the most popular variety of nonheading lettuce in the United States. The leaves are light green, wavy with a curled fringe, and when grown under glass are very tender and of excellent quality (fig. 5). Grand Rapids is used extensively for forcing in greenhouses in the East and Middle West, where heading

varieties do not succeed under glass, or where a specialized market has been developed for this particular type of lettuce.

HARVESTING

The usual method of harvesting the crop is to go over the field two or three, or in rare cases even four times, cutting only the merchantable heads each time. Generally the crop matures rapidly enough so that these cuttings may be made at intervals of one to three days, or a week at the most. Sometimes a crop matures so uniformly that one cutting suffices.

Heads which are in condition to harvest usually can be detected by their firmness and color, provided growing conditions have been favorable. As the plant matures it takes on a somewhat lighter appearance at the center, because of the exposure of the blanched

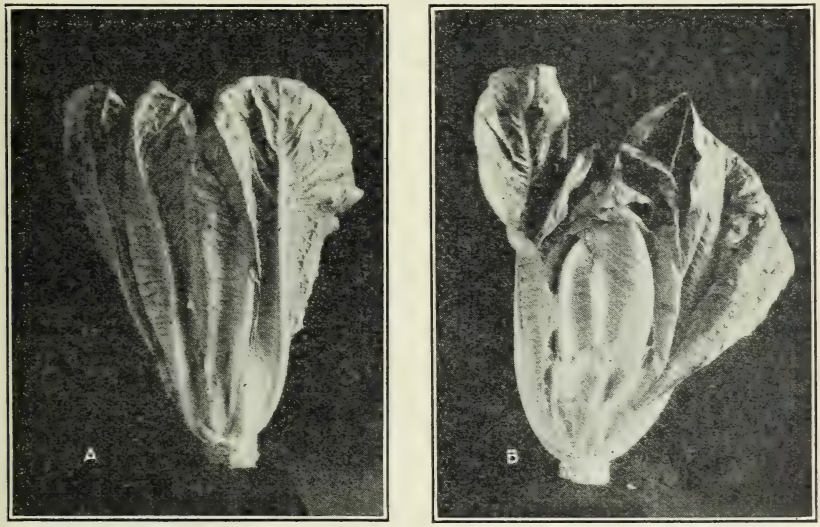

FIG. 4.—White Paris Cos lettuce, or Romaine

leaves which form the head. In some cases mature heads show a slight brownish-purple or pinkish discoloration on the tips of the uppermost encasing leaves. As a rule, well-matured heads show a compact and solid formation in the center distinct from the outer whorl of loose leaves. Under unfavorable conditions, however, head lettuce often becomes mature without being firm.

The firm head of good quality should not be confused with one that is slightly past maturity and has begun to develop a hard seed stalk in the center of the head. Such lettuce is bitter and coarse, of very poor quality, and usually is unmerchantable at any price. Immature heads when cut wilt rapidly, and are loosely formed and spongy instead of firm; overmature heads generally show a deep discoloration and a pithy or woody condition of the stem end when cut.

Whenever high prices prevail early in the season growers are tempted to begin harvesting and shipping too early, before the crop has reached the proper stage of maturity. Little, if anything, is

gained by this practice, for when the heads are cut too soon the yield is reduced and the quality is inferior. Stock of this description has a depressing effect on the market, at times very noticeable. The consumer curtails his purchases until he can be assured of better lettuce, and the lowered demand is immediately reflected in the returns to the shipper. Doubtless even the midseason market level at times is lowered and its recovery retarded because the trade is slow to regain confidence after several unprofitable experiences with early shipments of immature lettuce.

Cutting usually is done as early in the morning or late in the evening as field and labor conditions permit. During cool weather lettuce may remain uncut in the field for several days after reaching maturity without detrimental results, but during warm weather the crop should be harvested as soon as it reaches the proper stage of maturity. Heads that have been frosted in the field are very susceptible to decay if cut and handled while in that condition.

The heads are harvested by cutting just above the ground with an ordinary butcher knife or by giving them a slight twist and pull which breaks the brittle main root just beneath the surface of the

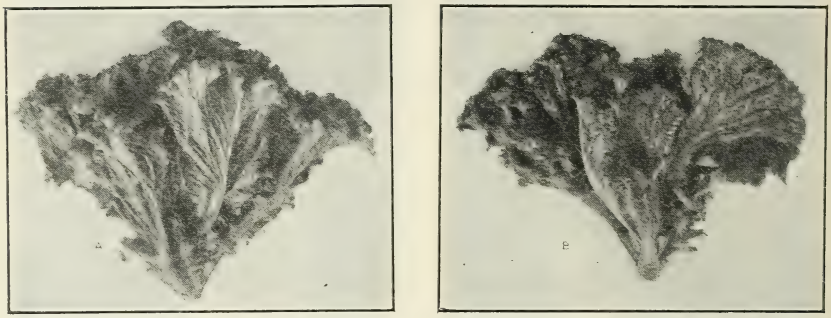

FIG. 5.—Grand Rapids leaf lettuce

ground. Usually two or more rows of heads are placed together upon being severed from the stem, after which they are either packed in the field or gathered up in field boxes, or in the regular shipping containers, loaded on trucks or wagons, and hauled to the packing shed.

In some instances the cutters place the cut and trimmed heads with the stems up on the ground between the rows, the packers following and filling the crates or hampers direct from the ground. Under this method considerable delay often occurs between the cutting and the packing, and if the day is warm and sunny a material amount of wilting results. Then, too, the heads may become dirty and unattractive from contact with the soil.

In some eastern sections the harvesting crew often works in groups consisting of two cutters and one packer each. Seven rows are cut by the crew each time across the field, the packer following the center row with a small light stand or table on which the crate is rested until filled. The cutters harvest the heads which are sufficiently mature, trim them, and pass them back to the packer. After the crate is filled it is deposited on the ground and another is placed

on the stand for packing, the empty crates having been distributed through the field before harvesting begins. The packages are lidded before hauling from the field.

GRADING AND PACKING

Lettuce packed in the field can not be graded as uniformly as when handled through a packing house, yet in most of the eastern sections the packing is done almost exclusively in the field. The preference for field packing in these districts is based largely on the desire to reduce the handling to a minimum, to keep the costs as low as possible, and to get the packed lettuce quickly from the field to the car.

Financial reverses suffered in some districts during recent years have awakened growers and shippers to a realization of the need for standardizing the grade and pack, and many are convinced that the most efficient method of obtaining uniformity is to have the crop prepared for shipment in central packing houses under competent supervision; that the benefits to be derived from uniformity more than outweigh the extra handling and added cost. Many growers and shippers are manifesting a rapidly growing interest in the need for improvements in the marketing of lettuce, especially in the grading and packing operations.

A reputation for dependable quality can not be gained by any shipper whose shipments lack uniformity. It is a demonstrable fact that the field packs put up by different packers vary widely with respect to the quality and condition of the product and in the degree of fullness of the package. The wide variation in the standards employed often causes difficulties in disposing of the shipments at a profit. If these difficulties are to be overcome, uniform standards must be adopted and rigidly adhered to.

Higher returns depend very largely upon better grading and packing. Uniformly good quality stimulates consumption, and the organization or individual whose brand or label always represents a high-class product is usually among the first to reap the benefit from this increased demand.

Standard grades properly and consistently used promote honesty and fair dealing and discourage the careless and unscrupulous packer. They enable the conscientious grower and shipper to realize a premium for care, honesty, and good judgment. They provide a common language with which to describe quality, condition, maturity, size, and all the factors that determine the value of a given shipment. They serve as a convenient, fair, and equitable basis for sales and for contracts covering future transactions in lettuce, for quotations to buyers, for inspection of the product at shipping points and in receiving markets, for adjustment of claims, for cooperative pooling, for financing, and for the reporting and intelligent comparison of market prices.

The United States Department of Agriculture has formulated standard grades for head lettuce which each year are coming into more and more extensive use.[2] The terminology employed in these

[2] These Federal grades may be subject to slight revision from time to time, and therefore are not given here. Copies may be procured without charge from the United States Department of Agriculture, Washington, D. C.

grades is the same in all markets and in all producing sections of the United States. "U. S. No. 1" lettuce means the same in New York State as in Florida and the same in New Orleans as in Boston. Dealers may rely upon receiving good merchantable lettuce if the lot conforms to the specifications of the U. S. No. 1 grade, without regard to the point of origin. It is questionable if it is profitable in the long run to ship lettuce lower in quality than U. S. grade No. 1, except in years of abnormally short crops or poor quality. Consistent adherence to high standards builds good will and creates confidence.

There are no recognized grades for leaf lettuce. The market requirements are for well-trimmed plants showing no broken or bruised leaves or other defects. The plants should be neatly arranged in the basket or other container, and the package should be well filled.

CULLING OUT DEFECTIVE STOCK

Successful growers and shippers habitually exercise care in grading and packing, discarding all heads showing serious defects or injuries. It is cheaper to cull out defective stock in the field or packing shed than to have it dumped upon arrival at the market after the expenses of labor, packages, freight, etc., have been incurred. Furthermore, a few poor heads in a package of otherwise good lettuce detract materially from its appearance and market value.

Immature, leafy heads seldom bring good returns. Heads showing severe decay, seed stems, or other serious defects never should be packed. Decay is especially injurious, and in its early stages the utmost diligence is required to prevent it from finding its way into the package. Slimy soft rot is progressive, and is easily communicable to other heads; if affected stock is packed with sound heads great loss may result in storage and in transit. It often accompanies or follows tipburn.

Detection of external indications of tipburn is sometimes difficult or even impossible. It is characterized by a brown or black discoloration of the edges of the inner leaves. Stock known to be affected is frequently bitter and is discounted severely on the markets.

TRIMMING

The removal of a few outer leaves from each head makes it appear neat, and will usually eliminate any surface blemishes that may be present, but close trimming is objectionable. (See fig. 6.) Outer or wrapper leaves serve as a protection to the head, and the trade prefers to have four to six of these outer leaves retained, provided they are clean and free from defects. The amount of trimming is usually determined by the degree of bottom rot or other defects that occur on the stem or outer leaves, the head being trimmed down until the base is clean. If it is necessary to take off all the wrapper leaves to clean up the head, it is often discarded entirely when packing. On the other hand, if the head is free from defects when harvested only the coarser, lower leaves are removed.

Considerable quantities of head lettuce whose outer leaves have become damaged in transit or in handling through mechanical injury,

decay, or other causes, are trimmed closely after arrival and find sales in many of the larger cities through the medium of street vendors. This lettuce often presents an attractive appearance, since the heads consist principally of the tender, succulent hearts.

SMALL SIZES PACKED SEPARATELY

The size of the head is not a reliable indicator of its quality. Under some conditions the heads will be firm and free from defects but will not develop to good size. The smaller sizes generally are discounted on the markets, and at times are practically unsalable, even though they may be of good quality. Market conditions alone can determine the wisdom of shipping small sizes.

With increasing values, demand for the smaller sizes becomes stronger and sizes which ordinarily are not wanted may at times be sold advantageously. Western lettuce, for example, usually is not

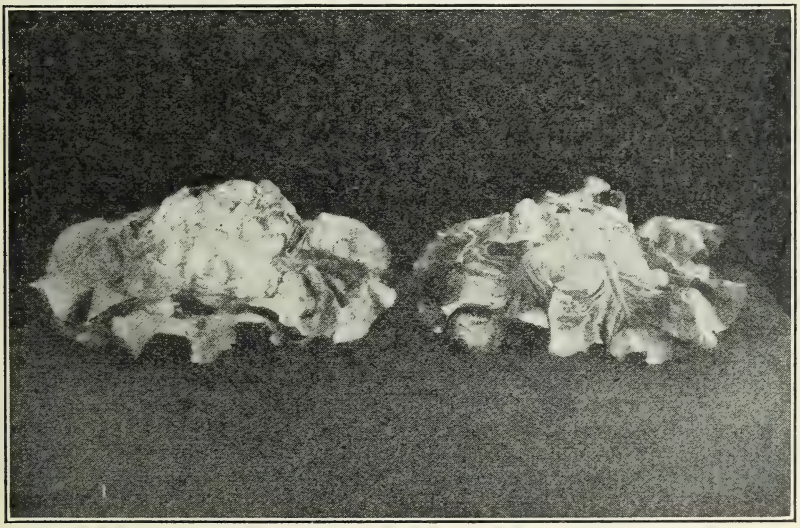

FIG. 6.—Proper trimming adds to the attractiveness of head lettuce

packed in sizes smaller than 5 dozen per crate, yet occasionally even 6 dozen packs may be sold with profit. An important point to keep in mind in connection with the sizing of the lettuce is that the trade prefers reasonable uniformity in the size of the heads in each package.

LETTUCE CONTAINERS

Lettuce is marketed in about 30 styles and sizes of crates and boxes and in addition some sections of the country use round stave baskets, splint baskets, barrels, and hampers. Some middle western gardeners market leaf lettuce in lug boxes and in secondhand vegetable, sugar, and flour barrels. Some use a 22-quart square-cornered splint basket, holding 10 pounds of leaf lettuce; others employ a 14-quart splint basket, which holds 3 pounds of lettuce (fig. 7). Other market gardeners use a ¾-bushel and a standard bushel round stave basket

for leaf lettuce, holding approximately 10 and 15 pounds, respectively.

New York shippers generally use a flat crate holding 2 to 3 dozen heads (fig. 8), but if the lettuce is of poor quality it is sometimes packed in hampers. New Jersey uses a 2-dozen crate of about the same style as the New York crate but of slightly different dimensions. Shipments from Florida are made in 1½-bushel hampers, and from other Southeastern States in 5-peck hampers; but in recent years a crate holding 2 to 3 dozen heads, of the same style but slightly larger than the New York crate, has attained more or less popularity in these sections.

In the past, three sizes of crates have been used in New York, but in 1924 a committee of growers recommended a standard crate having the following inside dimensions: 19 by 16 by 7½ inches. After the adoption of this standard by the New York growers the Florida

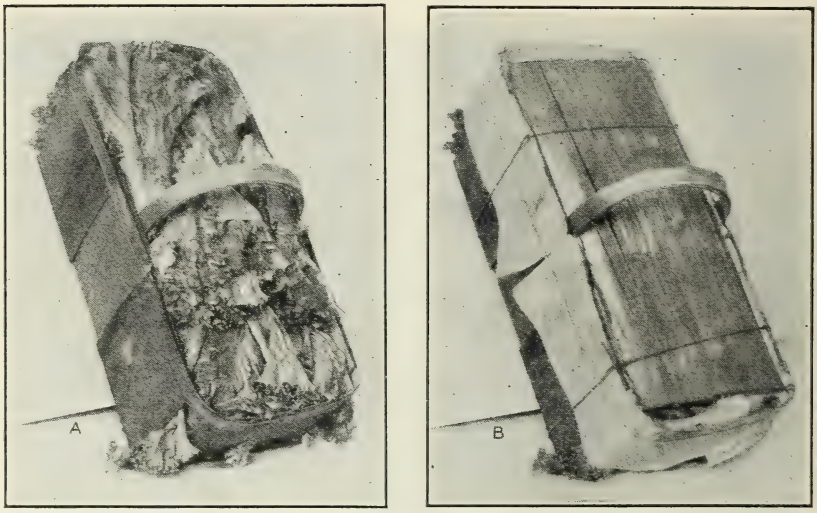

FIG. 7.—A popular basket used in marketing leaf lettuce

growers and crate manufacturers agreed to adopt it. In April, 1926, this crate was standardized by law in New York.

Until recently five different sizes of lettuce crates were used in California, holding from 3 to 6 dozen heads, according to the size of the lettuce (fig. 9), but in 1923 an amendment to the California fruit and vegetable standardization act recognized only two of these as standard in that State. Crates of about the same dimensions and holding the same number of heads are in use in other Western States, and occasionally a shipment is made from the Southeastern States in this type of package.

Many of these crates are more or less similar in shape and size, differing only slightly in one or more dimensions. The dimensions of the various 2-dozen crates can be readily standardized without detracting from the usefulness or the popularity of the package in any of the sections where this particular style of crate is used. There is likewise an urgent need and a strong demand for a uniform

lettuce crate holding 3 to 6 dozen heads, particularly in the Western States. The following inside dimensions seem suitable: (1) 2-dozen crate, 19 by 16 by 7½ inches inside, and (2) 3 to 6 dozen crate, 23⅛ by 18 by 13 inches.

The 5-peck and 1½-bushel hampers are gradually losing favor in the Southeastern States as shipping containers for lettuce. The principal objections to the hamper are that it is not so sturdy as the crate, its shape makes it more difficult to load than a rectilinear package, it does not allow sufficient ventilation of the contents, and does not permit the lettuce to be displayed as effectively. The hamper also lends itself readily to deceptive packing. The nature of

FIG. 8.—Two-dozen flat crate, ready for lidding

the container is such as to encourage the tendency of some packers to conceal small or defective stock in the bottom or center.

PACKING IN HAMPERS

When packing in hampers, the packer folds the outer leaves about the head and pushes it firmly down into the package. The bottom layer, usually consisting of two or three heads, is packed with the stems down, the second layer with the stems up, thus alternating in each succeeding layer except the top layer which is always packed with the stems up. Medium to large sizes, ranging from 26 to 40 heads to the hamper, are packed with 7 heads in the top layer. Small sizes, which range up to 5½ dozen or more to the hamper, usually are packed with 9 heads in the top layer. When the top is put in place the hamper is jarred gently to settle the lettuce, and the crossed wires are then pulled tightly across the cover. The pack

should be tight and the top layer high enough to hold the cover slightly above the rim of the hamper after wiring.

PACKING IN THE FLAT CRATE

Lettuce in the flat crate is packed usually in two layers, each consisting of 12 heads. The bottom layer of heads is placed with the stems down and the top layer with the stems up. In case the heads are too small to make a tight pack with 24 heads, each layer may consist of 15 or more, or 4 to 6 may be placed between the two layers. The crates should be well filled, and when lidded should show a bulge of about 1 inch.

PACKING IN THE LARGE CRATE

The large crate used in the western lettuce sections is lined with heavy oiled paper before packing. Two or four pieces of paper are

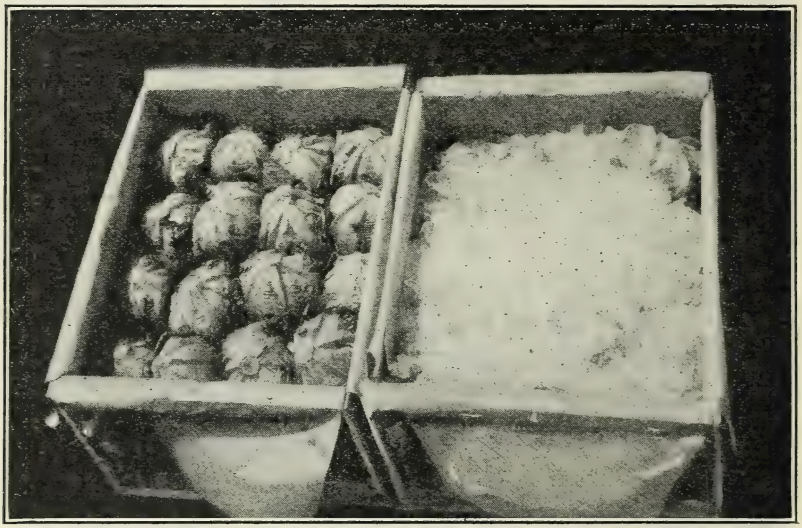

FIG. 9.—Arrangement of heads in the large lettuce crate, with ice between layers

used, so placed as to lap over at the top and bottom, completely inclosing the contents after the crated is filled. The lettuce is packed in three layers, stems uppermost, each layer consisting of 12 to 20 heads or more, according to the size. A shovelful of finely crushed ice is placed between each two layers, using 20 to 30 pounds in each crate. The pack should be tight and the package well filled so that the cover slats will bulge about 1 inch.

CARE REQUIRED IN HANDLING

Rough handling during the harvesting, grading, or packing operations usually causes severe injury to the heads, breaking or crushing the leaves and providing an opportunity for decay to set in. Aside from the probability of decay developing, a mechanically injured head presents a poor appearance, and therefore is likely to sell for less money. Lettuce is a delicate commodity, and requires the utmost care in all handling operations. Containers when filled with

lettuce should not be thrown around roughly nor stacked in high piles. Unnecessary handling or packing with too high a bulge often causes excessive brusing. The lettuce should be moved into a cool place as quickly as possible after harvesting, and kept clean and free from contact with defective stock or trimmings from diseased heads.

LETTUCE PACKING HOUSES

The western lettuce packing house usually consists of a simple covered platform or shed, although in some cases the buildings are more substantial and are used for packing other commodities as well.

The packing equipment proper consists of a long packing table divided into padded bins or compartments, one for each packer. The trimmers and packers work on opposite sides of the table. The field crates are delivered to the trimmer who cuts off a part of the stem from each head, trims away a few outer leaves, and places the head in the bin. The large and extremely solid heads go into one end of the bin and the small or inferior heads in the other.

The packer arranges the heads in the paper-lined crates on a convenient stand next to the table and places the crushed ice between the layers. The ice for the crates is usually prepared with a long-handled ice shaver or "spud," although some shippers use power-driven ice-crushing machines. Some houses are equipped with roller conveyors to facilitate handling the packed crates.

In some of the chief lettuce sections commercial packing has developed into an important factor in the industry. In the Imperial Valley there is scarcely a loading point that does not have at least one commercial packing house. These houses are operated by corporations, firms, or individuals, who make a practice of packing lettuce for small independent growers, charging for this service on the basis of the number of packed crates. This charge includes crates, paper, crate ice, and all labor required in the packing house and in loading the crates into the cars.

LOADING AND SHIPPING METHODS

Loading of lettuce into cars for shipment is a matter of vital importance in the marketing of this commodity. Much waste may be prevented by proper car loading.

Lettuce is highly perishable, and delivery in good condition requires that it shall not undergo frequent or extreme changes in temperature after harvesting. Consequently, car-lot shipments are made in refrigerator cars almost exclusively. Cars as a rule are equipped with floor racks, as these promote the rapid circulation of air about the load.

To avoid confusion in the use of terms describing the various elements making up a car load, the standard nomenclature adopted by the United States Department of Agriculture will be employed in this discussion. These terms and their meanings are as follows:

Layer.—A course or stratum of the load in a car, one package in height.

Stack.—A pile of packages extending from one side of the car to the other, one package in length.

Row.—A pile of packages extending lengthwise of the car, one package in width.

LOADING HAMPERS

When loading hampers, the packages in the first layer usually are loaded on ends, 6 or 7 rows wide, with alternate hampers reversed. The hampers may extend from end to end of the car, completely filling the space between the doors, but better circulation of air may be obtained by substituting a bracing for 1 or 2 stacks between the doors. Succeeding layers are placed in the same way, with tops against tops and bottoms against bottoms, as shown in Figure 10. When there are not enough hampers to make the top layer complete, they may be loaded on the sides with alternate ends reversed; at least enough of them should be so loaded to form a brace for the hampers standing upright in the ends of the car. In any case the load should be so solidly constructed as to prevent any shifting of the load in transit either from side to side or from end to end.

On account of its relatively light weight, lettuce packed in hampers may be loaded with the hampers lying on their sides, alternate hampers reversed. If the load is more than 4 layers in height, however, the top layers may retard the circulation of air, and their weight may be sufficient to cause considerable breakage and damage in the lower layers. It is maintained by some that better circulation of air is obtained by this method than if the hampers are loaded on end, provided the load is not too high; but in either case refrigeration of the load is very slow, because of lack of continuous air channels between the packages. The lettuce in the center of the load retains the field heat for a long time.

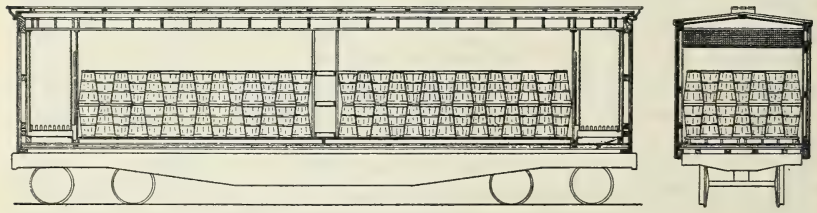

FIG. 10.—Arrangement of hampers in a refrigerator car

LOADING FLAT CRATES

The 2-dozen crate may be loaded on edge, 8 or 9 rows wide and 3 layers high, or lying flat, 5 rows wide and 7 or 8 layers high. In either case sufficient space should be left between the rows for circulation of air throughout the load. The maximum area of exposure to the circulating air is obtained if the packages are loaded on edge, as shown in Figure 11. The packages may extend the entire length of the car, but more effective air circulation may be obtained by the use of a bracing between the doors.

To prevent side swaying and shifting, it is necessary that each stack of crates be securely stripped crosswise of the car with 1-inch strips, two strips to each layer, nailed at the front and back edges of the top of each crate. Plaster laths laid end to end may be substituted for the regular car strips. One end of each strip should touch the side wall of the car; alternate strips should abut against

opposite sides. It is sometimes sufficient to strip only alternate layers, but in all cases the top layer is stripped.

In some sections crates of this type are often loaded flat, 7 or 8 layers high, with the packages so staggered as to have the bottom layer 5 rows wide, the next 4, the third 5, and so on, leaving a few inches between the crates for ventilating space. The crates in each layer are placed across the open space left between the crates in the layer below. This checkerboard method provides for no vertical channels between the crates and consequently the circulation of air

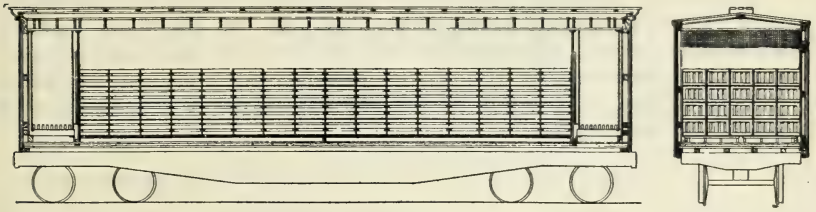

FIG. 11.—Arrangement of flat lettuce crates in a refrigerator car

is retarded and rapid and continuous refrigeration of the top of the load is prevented. The lettuce in the top layer of packages in a load of this kind often arrives in poor condition.

LOADING LARGE CRATES

Lettuce crates of the type used in the Western States are loaded 5 rows wide throughout the length of the car, 4 layers high.

The usual carload of large crates consists of 320 packages loaded solid, as shown in figure 12. The outside dimenions of the crate are such that 5 rows take up almost the entire width of the car and 16 stacks take up practically the entire length. Manifestly in a load of this kind little space can be left between the crates for air chan-

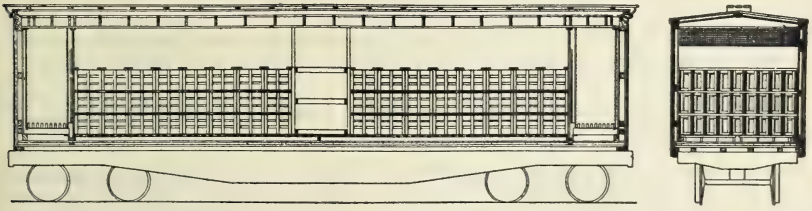

FIG. 12.—Arrangement of large lettuce crates in a refrigerator car

nels, but in spite of this the lettuce usually carries to market in good condition, in all probability because of the ice within the packages.

During severely hot weather the lettuce in crates that touch the walls of the car may become slimy in transit. It is therefore generally considered good practice in summer to load large crates solidly in the car, leaving no air passages between the rows but as much space as possible between the load and the walls, dividing it equally between the two sides. Car strips, if securely nailed to all layers, serve to hold the load in this position.

Irrespective of the types of packages used, all end-to-end slack should be taken up as the loading proceeds, beginning with the first stack of containers placed in the car. If a small amount of play is left between the stacks, it is practically impossible to tighten up the load by forcing a bracing tightly into position between the doors; the bracing is almost certain to loosen up and perhaps to collapse as a result of the weaving and the end thrusts encountered in transit. Loose loading frequently results in breakage and damage.

The first stack should be placed solidly against the bunker and each succeeding stack placed firmly in contact with the packages already in position. If measurement of the car prior to loading shows that some end play may be expected which will be too small to permit the construction of a center bracing, this space can be taken up as the loading progresses by nailing car strips to the front of a few stacks of packages.

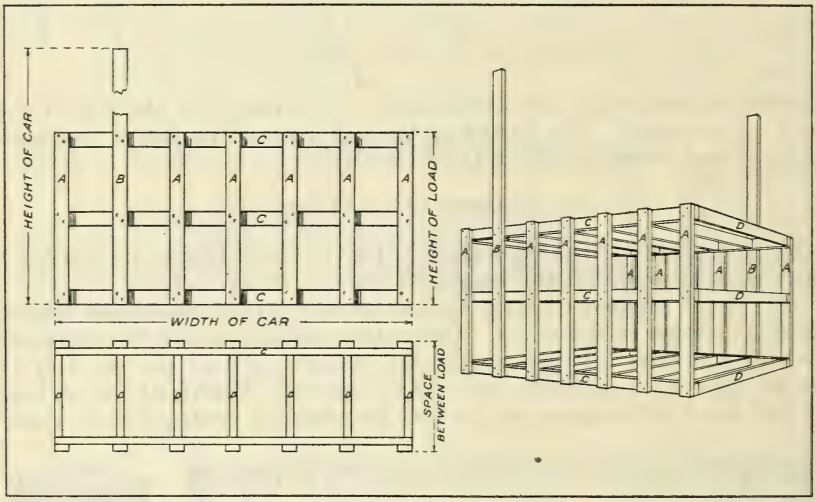

FIG. 13.—Diagram of center bracing recommended for use in loading lettuce

Directions for constructing the center bracing shown in Figure 22 are as follows:[3]

For uprights A and B and braces D use 2 by 4 inch lumber: the horizontal strips C may be 1-inch boards. Make two gates as shown on the left: one upright (A or B) to be in the center of each row of packages: the horizontal strips C to be nailed to uprights. One upright (B) in each gate should extend to the ceiling of the car to prevent buckling of the brace. Place one gate against each end of the load with the uprights touching the packages. Wedge braces D tightly into position between the gates at top, bottom and center, toe-nailing securely to the horizontal strips. Nails should not be driven into the car floor, walls or ceilings. The diagram at the right in Figure 13 shows the bracing assembled.

REFRIGERATION

Shipments in which the bunkers are kept filled with ice until the car arrives at its destination are said to be made under "Standard

[3] I. C. C. No. 10, Specifications of Standard Containers for Fresh Fruits and Vegetables and Loading Rules No. 3, issued by agent for numerous carriers, Oct. 26, 1921. Present address of agent is 101 Marietta Street, Atlanta, Ga.

refrigeration," and many shipments of lettuce are made in this way. During recent years many car lots from the Western States have broken ice scattered over the top layer of crates in addition to the crushed ice within the packages. There is considerable controversy over the real merits of this practice, however, and the department is now making an extensive study of the whole subject of "body icing."

The use of salt in the bunkers is becoming increasingly popular in some sections of the West. The purpose of adding salt to the ice is to obtain lower temperatures within the car and to obtain them more quickly than is possible by the use of ice alone.

PRECOOLING AND STORING

In some producing sections where cold-storage facilities are available, lettuce is often precooled by placing the packed containers in the storage house for short periods before loading at a temperature of 30° to 32° F. Thorough cooling by this method often requires several days. On the other hand it is not considered advisable as a rule to delay shipment longer than a week or two on account of the increased likelihood of loss by decay. Lettuce held for longer periods usually should be moved only to near-by markets.

Some shipments of precooled lettuce have been made in an experimental way in an effort to determine the advisability of precooling without placing the lettuce in cold storage. The field crates filled with lettuce are immersed for an hour or more in water having a temperature of about 34° F.; the heads are then packed in the usual manner. The methods employed have added some expense to the cost of packing and packers have generally objected to handling the lettuce after it was taken from the cold water. Experience with thoroughly precooled lettuce indicates that such stock carries better and remains in good condition longer than lettuce that is not precooled.

At times, small quantities of lettuce are held in cold storage for limited periods after arrival in the markets. The length of time any particular lot may be stored and yet be withdrawn in good condition seems to depend primarily upon the condition of the lettuce at time of cutting, the promptness with which it is cooled to proper storage temperature, and the degree of care with which it is handled; but it rarely exceeds two weeks even under the most favorable conditions. Lots which will probably be held in storage for some time should be carefully selected. The heads should be bright, fresh, and crisp, not too mature, should contain no tipburn, decay, or other defects and should not be bruised or broken by careless, rough handling. The lettuce should be fairly dry; when stored wet it slimes quickly.

ORDERING CARS

Whenever possible, requests for cars should be made at least 24 hours before the shipper is ready to begin loading, in order to give the railroad agent time to make necessary provisions for the needed equipment. The car supply must always be taken into consideration by the shipper. In case of shortage the railroads frequently are unable to fill all orders for cars, and find it necessary to apportion the available supply among the shippers in accordance with their respective requirements.

Requests may be in writing, although this is not always insisted upon by the railroads. They are addressed to the local agent and should specify the type of car, the equipment wanted, and the date it is desired. A request for a car may be made in a form similar to the following:

WILLIAMSON, N. Y., *July 16, 1924.*

AGENT N. Y. C. R. R. Co.:

Please place one refrigerator car on my siding by 9 a. m. July 18, for loading with lettuce. The bunkers must be filled with ice, and the car equipped with 5-inch false floor.

Yours truly,

JOHN DOE.

Good practice requires that after a car is placed for loading it be examined thoroughly to see if it conforms to the specifications contained in the request. The doors and hatches should fit tightly and the car should be in good condition otherwise. If it is not in good order it should be either refused or used under protest. When it is necessary to accept a car which, in the shipper's opinion is not suitable, a protest in a form similar to the following may be addressed to the agent:

WILLIAMSON, N. Y., *July 18, 1924.*

AGENT N. Y. C. R. R. Co.:

You are informed that car P. F. E. 31353, placed by you for loading with lettuce in accordance with my request of July 16, is not suitable on account of a broken door and leaky roof. Notice is hereby given that this car is loaded under protest.

Yours truly,

JOHN DOE.

Orders for cars and notices of protest should be written in duplicate, the shipper retaining copies for possible use in establishing claims for damage or loss in transit.

DEMURRAGE

Under existing regulations shippers are allowed 48 hours in which to load, after which a demurrage charge is made for each day or fraction of a day until the car is released. The free time is computed from the first 7 a. m. after placement on public-delivery tracks and without notice to the shipper. However, if a car is not placed within 24 hours after 7 a. m. of the day for which it is ordered, free time is computed from 7 a. m. on the next succeeding day after notice of placement is sent or given to the shipper. On cars held for consignment, diversion, or reshipment, or held in transit on the order of the consignor, consignee, or owner, 24 hours free time is allowed.

RAILROAD BILLING

The number of packages, a word or words descriptive of the product, and the total weight of the shipment are entered in the columns provided on the bill of lading. The shipper also declares in writing in shipping orders and bills of lading, at the loading station, whether or not the shipment is to be initially iced by the carrier, is to be iced or reiced in transit, or is to be transported without reicing. If salt is desired, the shipper must state the percentage to be used and the icing stations at which it is to be added. The carrier may permit the shipper to perform the icing service at the loading point.

Two forms of bills of lading are used, the "straight" or "open" form and the "order" or "order-notify" form. The straight or open form is the one prescribed by the Interstate Commerce Commission as the standard bill of lading for universal use. The order bill of lading, by inference or usage, is considered also as a legally authorized document, as its conditions are almost precisely the same as the other, the only difference being that it contains a provision making it necessary for the original bill of lading issued by the carrier to be surrendered before delivery or diversion of the car may be accomplished.

This provision restricts the use of the order-notify bill mostly to cases where direct sale is made. Its advantage in such cases is that it is generally recognized as negotiable paper when accompanied by draft and placed in bank, and it enables the shipper to procure prompt availability of the amount involved, as he may obtain the money from the bank at the time of making the draft.

The straight or open bill of lading is more generally used for the reason that it lends itself to the freer and quicker handling of shipments in cases where diversion or change in consignee may be required. The shipper may consign his shipments to himself, thus insuring that the delivery will not be made by the carrier at destination except to him or to his order. Such order may be made either by telegraph or letter.

If diversion or delivery to a specified consignee is desired, the shipper need only present his copy of the bill of lading as evidence of ownership to the agent of the carrier company at point of origin and give him necessary instructions. In cases where shipments are not paid for, draft may be attached to the order and the consignee instructed to take up the draft in the bank and procure the delivery order; or, if other arrangements for payment have been made, delivery may be effected on telegram or letter from shipper or his agent.

ROUTING CARS

For purposes of economy and to facilitate the handling of shipments at destination, buyers frequently instruct shippers to route cars over stipulated railroad lines. Failure to observe these instructions may result in substantial loss to both the shipper and the receiver. In some cities shipments of produce can not be handled conveniently unless they are received over a certain railroad. In Pittsburgh, for example, the produce yards are located on the Pennsylvania tracks and the handling of shipments received over any other line is accompanied with some difficulty. It is especially important, therefore, for the shipper to follow the buyer's instructions regarding the delivery line. Failure to do so is considered a valid reason for rejecting a shipment.

In the absence of instructions the shipper should route the car by the most direct line and in such a manner that delivery will be made by a railroad that has yards convenient to the produce district. Circuitous routing and unnecessary transfers between connecting lines should be avoided.

DIVERTING CARS

It is frequently necessary to divert a car in transit or to reconsign it after arrival in a market. Diversion orders usually are filed with the local agent, but if desired they may be wired to the general freight agent of the originating line or to the agent of the delivering line at the first destination.

The essential facts contained in a telegram ordering a diversion are the car initials and number, date of shipment, shipping point, destination, contents of the car, names of the shipper and the consignee, the city to which the car is to be diverted, and the name of the new consignee. The words "protect through rate" are included to avoid the possibility of a freight charge made up of a

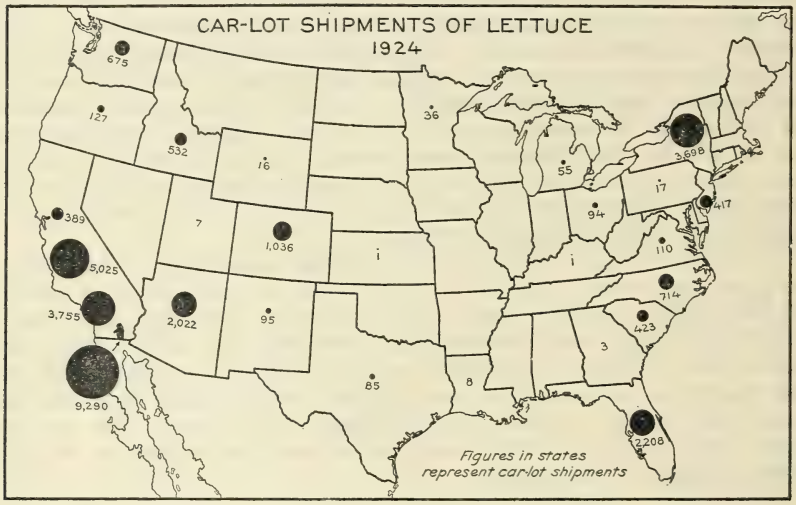

FIG. 14.—Car-lot shipments of lettuce are now originating in 24 States

combination of local rates. The following example indicates how the telegram may be worded.

WILLIAMSON, N. Y., *July 20, 1924.*

GENERAL FREIGHT AGENT,
Pennsylvania R. R. Co., Pittsburgh, Pa.:

From Williamson eighteenth consigned ourselves Pittsburgh car P. F. E. 31353 lettuce. Divert protecting through rate. White Produce Co., Cincinnati. Route Pennsylvania. Wire accomplishment.

JOHN DOE & CO.

Diversion instructions given by telegraph, by telephone, or in person should be confirmed promptly by a written order, a copy of which is retained by the shipper. This confirming order should give clearly the essential facts of the request and in addition should state the day and hour at which the original order was filed.

CAR-LOT MOVEMENT AND DISTRIBUTION

Car-lot shipments of lettuce are now originating in 24 States instead of in 12 as in 1916 (fig. 14). The industry has made its greatest strides in States producing Iceberg lettuce, until in 1924 three-

fourths of the lettuce shipments originated in States in which the leading varieties are of this type. Substantial increases in acreage and production have been reported during the last few years in many of the Eastern States, but the largest gains have been in the Western States. As illustrated in Figure 1, car-lot movement from these Western States increased tremendously from 1919 to 1923. From 41 cars in 1919 Arizona's shipments increased to 1,108 cars in 1923; California's shipments grew to 15,113 cars; Colorado increased its shipments from 7 cars to 1,436; Idaho from 1 car to 1,241, and Washington from 19 cars to 1,081.

Active movement of lettuce to consuming markets continues throughout the year, and the crop is now practically as much an all-year product in the markets as are potatoes, cabbage, and onions. June ordinarily is the month of lightest shipments, and the heaviest movement occurs from December to April. Figures 15 and 16 convey an idea of the sources of supply and the car-lot movement in the United States throughout the year.

Nearly all of the shipments during the first five months of the year are from California, Florida, South Carolina, North Carolina, and Arizona. In addition, supplies of northern hothouse lettuce are received in many markets during this period. As the season progresses, movement begins from regions in the North. The markets during June and July are supplied mostly from California, New York, Washington, and New Jersey. In August and September the markets are supplied chiefly from California, Colorado, and New York. In October and November shipments come mostly from California, Idaho, New Jersey, and New York, and in December the markets draw receipts mainly from California, Florida, and Arizona.

For California, Arizona, and Florida the record of a calendar year includes parts of two shipping seasons. A few States have two lettuce crops within the calendar year. New Jersey and the central district of California are examples of two-crop regions.

The railroads reported to the United States Department of Agriculture 4,700 car-lot shipments of lettuce in 1916; in 1924 this figure had amounted to over 30,000 cars, or an increase of nearly 600 per cent in eight years. (See Table 2.)

TABLE 2.—*Car-lot shipments of lettuce, by State of origin,*[1] *1916–1924*

State	1916 [2]	1917 [2]	1918 [2]	1919 [2]	1920	1921	1922	1923	1924
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Arizona	17	64	64	41	165	166	678	1,108	2,049
California	1,244	2,013	2,051	2,731	6,350	9,746	9,744	15,113	18,480
Colorado	24	1	1	7	125	244	812	1,436	1,036
Florida	1,528	1,116	2,352	2,134	3,120	2,286	3,323	3,146	2,257
Idaho				1	26	182	889	1,241	532
New Jersey	88	215	171	245	515	478	571	456	417
New York	1,062	1,423	1,334	1,761	2,138	3,361	3,167	3,817	3,698
North Carolina	83	181	226	319	265	448	622	718	714
South Carolina	132	161	375	395	356	583	987	577	423
Washington	1			19	345	632	812	1,081	674
All others	521	254	385	365	413	490	635	792	655
Total	4,700	5,428	6,959	8,018	13,818	18,616	22,240	29,485	30,935

[1] In considering this tabulation it should be borne in mind that local truck deliveries and less-than-car-lot shipments by freight or express are not included. Complete and dependable records of these are not available, yet in some sections such shipments constitute a considerable proportion of the commercial production.

[2] Records prior to 1920 are only approximately accurate.

No accurate figures are available of the quantity of greenhouse lettuce produced and shipped. The northern greenhouse sections market lettuce locally for about 10 months of the year, and during the late winter and spring, the seasons of heaviest production, the

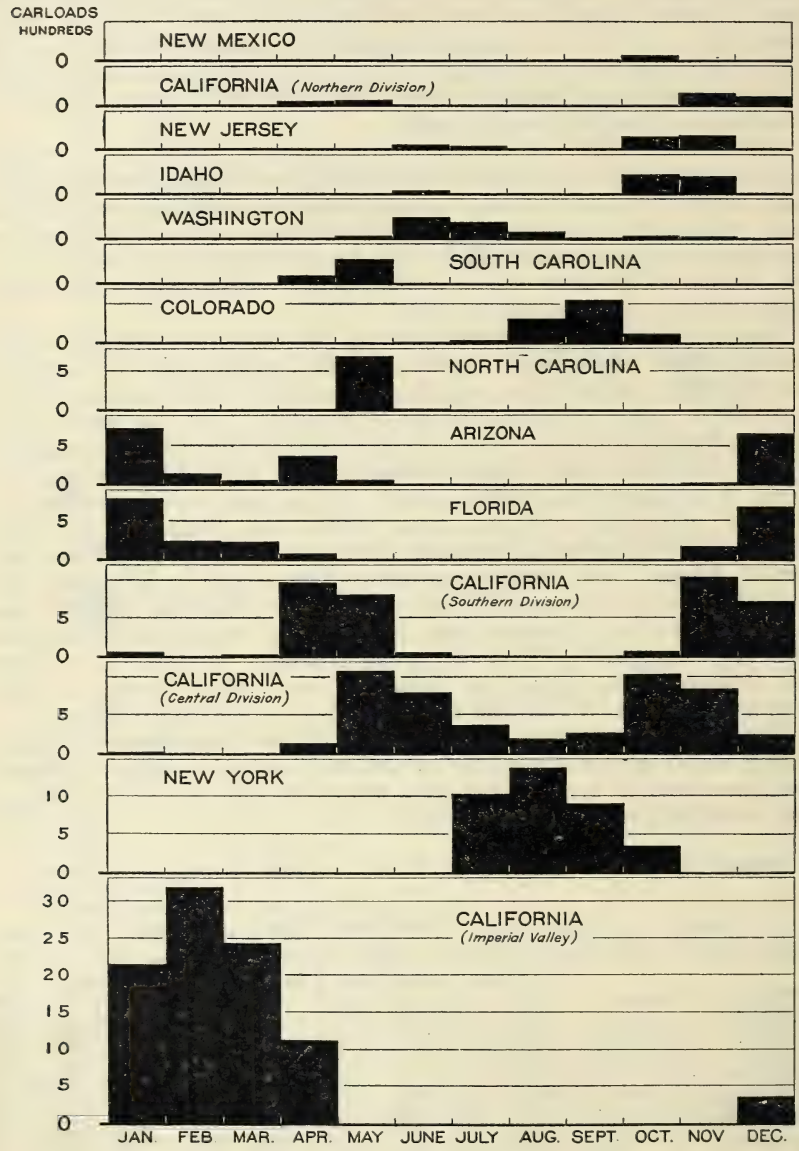

FIG. 15.—No one section has the market monopolized

crop frequently moves in car lots to more or less distant markets. The Cleveland section, for example, at times supplies cities and towns within 500 miles, mainly Pittsburgh, Detroit, Cincinnati, and Youngstown.

Not all of the lettuce grown finds its way to market, and the proportion marketed each year is not constant. Discouraging market conditions or unfavorable climate and cultural conditions may cause a portion of the crop to be left in the fields or to be discarded during the sorting and packing operations. Car-lot shipment records, together with accurate production estimates in the important lettuce-growing States in the East for several years, indicate that in these States usually about 70 to 80 per cent of the crop is shipped in car lots, though in some seasons wide variations from this average have occurred. Most of the remainder is not marketed, though in localities situated advantageously with respect to large consuming centers considerable tonnage is shipped by truck or express or in mixed shipments, records of which are fragmentary.

With rapidly increasing supplies of lettuce, wider geographical distribution of shipments is essential. Until recently the large cities

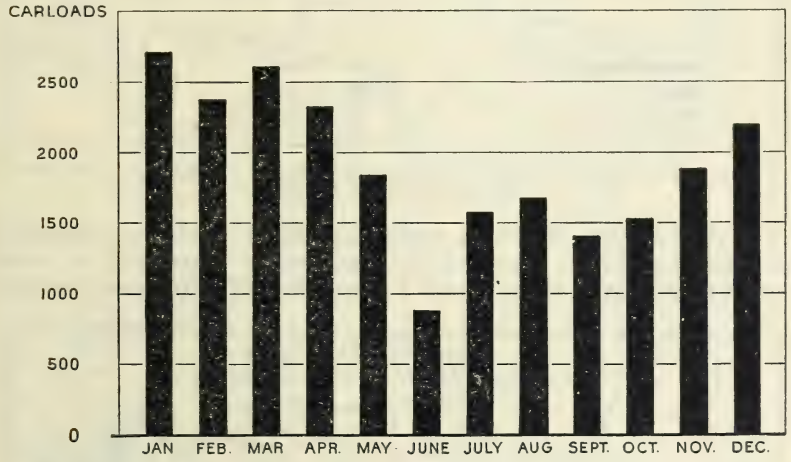

FIG. 16.—Car-lot shipments of lettuce are heaviest during the winter and early spring but fairly regular every month except June

took practically all of the lettuce shipped, but within the past few years some effort has been made by shippers to find an outlet for a larger portion of the crop in the smaller cities and to create a demand that would develop these points into car-lot markets.

Distribution to these smaller markets in original car lots from some sections is still limited. Of 2,439 cars of the New York crop shipped in July and August, 1924, approximately 92 per cent went to Baltimore, Boston, Chicago, New York, Philadelphia, Pittsburgh, St. Louis, and Washington.[4] The crop was sold in 33 markets in all, located in 19 States and the District of Columbia. The area of distribution was limited to the northeastern quarter of the United States, largely because of keen competition from the Western States coupled with high transportation costs on distant shipments.

Thirteen cities, each with a population of more than 325,000, took most of the New York crop in 1924. More than 85 per cent of

[4] Data compiled by New York State Department of Farms and Markets.

Florida's shipments in 1924 went to 11 cities, the smallest of these having a population of about 400,000.

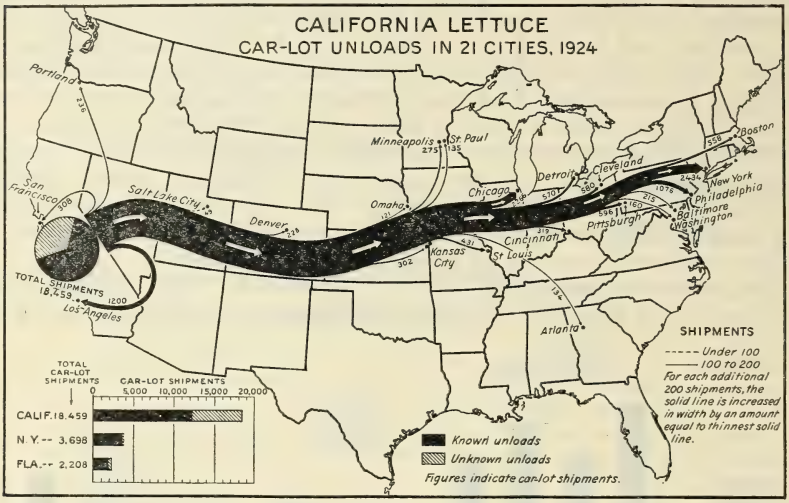

FIG. 17.—Final destinations are known for approximately two-thirds of California's lettuce shipments in 1924

The distribution of lettuce from some of the western sections, on the other hand, has made a very noticeable expansion in recent years, and although there is still a great deal of untouched territory,

FIG. 18.—Final destinations are known for practically all of the lettuce shipments from New York State in 1924. New York City took more than two-thirds of the total

this expansion has to some degree kept pace with the growth of production in these districts. It is not possible to make a thorough

analysis of the distribution because complete diversion and delivery records are not available, but the information at hand furnishes a fairly comprehensive idea of the destinations of shipments. Final destinations reported for more than 9,000 cars shipped from the Imperial Valley between January 8 and April 10, 1924, show that these cars went to 196 cities and towns in 44 States and the District of Columbia. Seven hundred and forty cars of lettuce shipped from Colorado points between August 6 and October 7, 1924, went to 58 markets in 28 States and the District of Columbia. Twenty-one of the important receiving markets in the United States took 66.2 per cent of California's shipments and 62.3 per cent of Colorado's shipments. Distribution of the 1924 crop from California, New York,

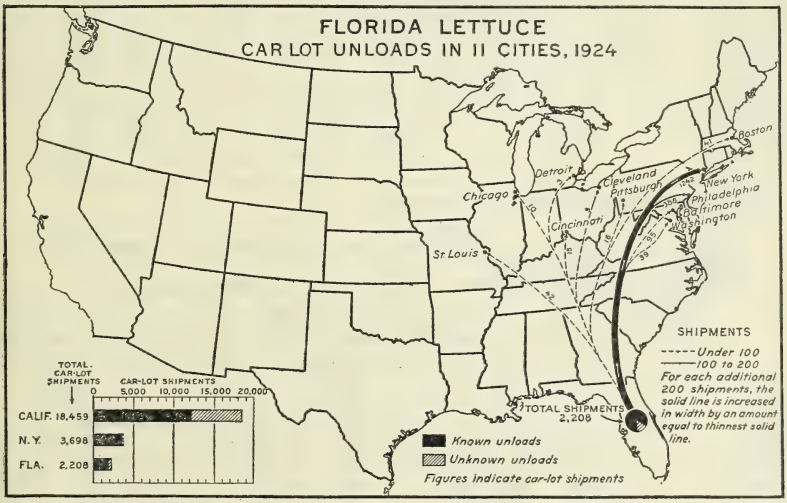

FIG. 19.—Final destinations are known for about 85 per cent of the lettuce shipments from Florida in 1924. New York City took more than half of the total

and Florida, which together produced approximately 80 per cent of the total United States shipments, is shown in Figures 17, 18, and 19.

Tables 3 and 4 constitute a record of the car lots of lettuce unloaded in these 21 markets by months during 1924.[5] (See also fig. 20.)

[5] These figures should not be construed as a complete record of all lettuce consumed in these markets during that year, for in most of them local market gardeners supplied part of the demand by wagon or truck, and further supplies were received through unreported less-than-carlot shipments by freight or express. For example, receipts of this sort in New York City from New Jersey producing sections in 1924 have been computed by the Bureau of Agricultural Economics as equivalent to 832 car lots. During the same year the equivalent of approximately 65 car lots was received in this way from New York producing sections.

TABLE 3.—*Unloads of lettuce in 21 cities, by months, 1924*[1]

City	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	Car lots												
Atlanta	17	10	15	14	16	11	11	11	17	14	21	18	175
Baltimore	80	66	31	45	94	7	49	43	48	42	44	70	619
Boston	100	87	85	64	107	50	30	60	71	22	71	89	836
Chicago	272	209	270	343	416	235	230	261	216	246	330	303	3,331
Cincinnati	78	54	49	47	51	26	29	24	44	29	55	78	564
Cleveland	82	70	77	69	91	57	39	42	39	41	63	83	753
Denver	37	41	32	40	48	30	20	65	78	21	27	39	478
Detroit	73	65	81	79	89	81	42	32	36	46	57	76	757
Kansas City	42	55	49	34	33	20	40	20	36	41	49	38	457
Los Angeles	127	181	154	29	32	191	144	112	107	85	19	20	1,201
Minneapolis	48	36	35	28	49	30	15	15	10	26	28	37	357
New York	715	602	541	600	1,131	175	454	917	532	320	378	768	7,133
Omaha	16	14	8	9	31	11	11	10	11	16	23	21	181
Philadelphia	273	211	201	222	339	105	127	162	153	128	145	253	2,319
Pittsburgh	139	96	85	102	130	63	22	24	26	44	54	91	876
Portland, Ore	42	52	62	46	21	0	0	0	0	0	25	46	294
St. Louis	95	86	82	71	37	15	57	50	61	45	71	105	775
St. Paul	15	19	20	24	18	12	7	6	4	12	13	21	171
Salt Lake City	0	0	0	0	11	6	4	6	7	3	7	12	56
San Francisco	94	71	74	29	9	2	0	0	2	0	0	27	308
Washington	41	35	38	20	34	10	19	30	33	26	26	44	356

[1] Incudes boat receipts reduced to car-lot equivalents.

TABLE 4.—*Unloads of lettuce in 21 cities, by States of origin, 1924*

[Car lots including boat receipts reduced to car-lot equivalents]

City	Ariz.	Calif.	Colo.	Fla.	Idaho	N. J.	N. Y.	N. C.	S. C.	Wash.	Misc.	Total
Atlanta	16	134	19		1					5		175
Baltimore	27	215	7	95	4	4	158	6	15	1	87	619
Boston	29	558	2	41	1	1	167	7	22	5	3	836
Chicago	170	2,266	76	10	86	2	314			254	153	3,331
Cincinnati	90	319	42	15	22		54			5	17	564
Cleveland	54	580	43	3	8		21	3		12	29	753
Denver	41	228	170		16					14	9	478
Detroit	7	570	63	3	35		24			49	6	757
Kansas City	33	302	71		12		2			28	9	457
Los Angeles		1,200	1									1,201
Minneapolis	2	275	16		27		1			31	5	357
New York	235	2,434	20	1,242	24	1	2,155	538	359	14	111	7,133
Omaha	11	121	23		9					11	6	181
Philadelphia	65	1,076	10	388	22	46	461	103	80	18	50	2,319
Pittsburgh	78	596	12	16	26		63	2	3	14	66	876
Portland, Oreg	25	263			3					2	1	294
St. Louis	43	431	61	42	15		122			6	55	775
St. Paul	6	135	6		2					18	4	171
Salt Lake City		49	2		1						4	56
San Francisco		308										308
Washington	5	160	2	39	1	4	101	7	7	1	29	356
Total	937	12,220	646	1,894	315	58	3,643	666	486	488	644	21,997
Unloads as a percentage of total car-lot shipments	46.3	66.2	62.3	85.8	59.2	13.9	98.5	933	(1)	72.3		71.3

[1] Some discrepancies in the reports cause unloads of South Carolina lettuce to exceed shipments reported from that State.

Development of the small cities of 25,000 to 50,000 inhabitants into car-lot markets for lettuce would no doubt go a long way toward widening distribution and increasing consumption. Growers and shippers doubtless would find outlets for greater tonnage by exerting every effort to open up as many as possible of these smaller markets to direct shipments instead of shipping habitually to a few of the large distributing centers.

The markets at times become glutted with lettuce shipments. With numerous shippers and organizations of growers in many sections acting independently of each other this is not surprising, for whenever the supplies are low in any particular city and conditions there seem to promise better returns than elsewhere, many cars are immediately consigned or diverted to that market. Often the supplies received are sufficient to overstock the market and to cause a sharp decline in prices, thereby converting expected gains into losses.

Considerable improvement could perhaps be made in this situation by establishing a well-managed central organization in each of the various sections, consisting of individual shippers, brokers, growers' organizations, and other car-lot distributors, to act as a clearing house for the collection and dissemination of market and shipping-point information and to arrange distribution in such a manner as to equalize the supply and demand as nearly as possible. Efforts

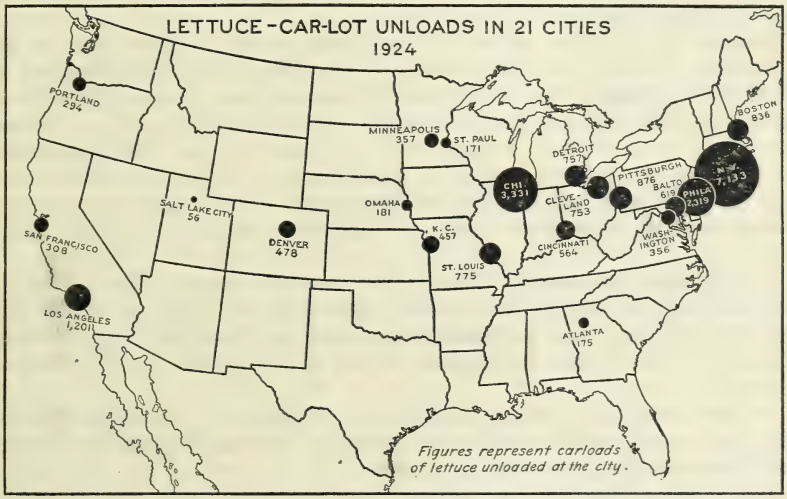

FIG. 20.—These 21 primary markets account for 71 per cent of the total car-lot shipments of lettuce in the United States

made in certain sections to set up central clearing houses for this purpose have met with little success because of a lack of true cooperation among those to whom the organization looked for its membership, with the result that the degree of control exercised by the organization was insufficient to permit it to become an influential factor in distribution.

PREFERENCES IN CONSUMING MARKETS

The existence of certain preferences and prejudices among the consuming public and the trade is a factor which vitally affects distribution, prices, sales policies, and commercial practices at shipping points and in the receiving markets.

Because of the large quantities of lettuce of good quality available on the markets in recent years, the consuming public has developed a taste for the very best. Buying is done with greater discrimination than formerly. Lettuce that is well headed, crisp, and free

from defects is usually in good demand, while poorer stock is discounted heavily.

In most markets Iceberg-type lettuce is meeting with increasing favor. Only a few years ago Big Boston was the leading variety, but recently the firm crisp varieties have been demanded by many who at one time would not consider buying if Big Boston was not to be had. Big Boston moves in decidedly better favor in New York City, Philadelphia, and Boston, than in western and mid-western cities. About three-fourths of the lettuce receipts in New York consist of Big Boston. Nevertheless the Iceberg type is gaining rapidly in popularity even in these three markets.

Leaf lettuce is favorably received in some cities, particularly in Cincinnati, Cleveland, and Pittsburgh, but on the whole the loose-leaf varieties are not so popular as the heading varieties, and in some cities are being crowded from the market. Cos lettuce or Romaine meets only a limited demand, mostly from the Italian and other Latin peoples.

The markets prefer standard packages to which the trade is accustomed. Iceberg in the standard western crate, Big Boston in the 2-dozen crate or the 1½ bushel hamper, and Grand Rapids in either the 3-pound or the 10-pound splint basket can be counted upon to meet a better demand than if packed in odd containers. Lettuce in unusual packages is handicapped in competition with stock in standard and attractive packages. The container should always be well filled, as there is a strong prejudice against slack packs.

A preference is usually shown for medium sizes. Heads which will pack 3½ to 4½ dozen in the large crate or 2 dozen in the flat crate generally sell at a premium over very small or very large heads. Lettuce of these sizes will pack 30 to 40 heads to the 1½-bushel hamper.

Demand continues with considerable uniformity throughout the year, yet most markets report a slightly increased activity during the Christmas holidays and at Easter.

These preferences do not remain constant, and may be altered in a comparatively short time through advertising, changed standards of quality, and other conditions. Therefore, those sections which have been laboring under a reputation for undependable quality by devoting their attention carefully and persistently to improving the quality of their shipments and to bettering their merchandising methods, may in a relatively short time establish themselves and their product in the good will and confidence of the buying trade.

PRICES

Jobbing prices of lettuce frequently show wide daily ranges, reflecting great variation in quality and condition of stocks offered. It is not uncommon, for example, for sales of 2-dozen crates to be made at prices ranging from 25 cents to $2 or even more in a given market on the same day, with proportionate ranges on stock in other types of packages. Sales of Big Boston usually show wide differences in daily prices and more frequent fluctuations than do Iceberg type sales, because of greater uniformity in quality and condition of western supplies.

Prices often fluctuate sharply, slumping rapidly and recovering rapidly. The variation of daily wholesale prices of Big Boston lettuce from the average price for the period December, 1922, to April, 1923, in New York City was twice that of Long Island potatoes, for example.[6]

It has been commonly believed that jobbing prices in each market are influenced inversely by the visible supplies in that market; that is, when receipts are heavy prices fall and as supplies diminish prices recover. It is true that at times current receipts exert a strong influence upon prices; but study of the weekly average prices to jobbers and total car-lot unloads of lettuce by weeks in several of the important markets reveals the fact that the correlation between the two over a period of one year is so small as to be almost wholly insignificant. Manifestly prices are determined by other influences as well as by current car-lot receipts. Doubtless general business conditions, weather, production, current loadings, shipments en route, business interruptions, and deviations from the normal demand caused by holidays, marked differences in the quality and condition of offerings, receipts of locally grown lettuce, etc., all exert some influence on jobbing prices.[7] Any attempts to forecast price tendencies can have little success unless all these factors are taken into consideration.

As a rule, in those markets where Big Boston constitutes a substantial proportion of the receipts, prices of the two types of head lettuce tend to parallel each other, with Iceberg usually outselling Big Boston. Evidently factors responsible for price changes in one type generally produce similar and proportionate changes in prices of the other type, despite the popular belief that each supplies a separate and distinct demand. The higher values of Iceberg types are doubtless caused partly by the general preference for the crisp, compact heads of this type and partly by the better grading of western lettuce.

Jobbing prices in the large markets fluctuate with considerable similarity, with due allowance for the effects of temporary local gluts and famines that are not experienced simultaneously by all cities (fig. 21). For the most part the factors having the strongest influence on price seem to be general rather than local, and to affect all markets with more or less uniformity.

Prices paid by consumers in Washington, D. C., and Boston, Mass., for Iceberg type lettuce during the 1924 Imperial Valley season were apportioned among the agencies of production and distribution as shown in Figure 22. It will be noted that the margins are approximately the same in both markets.

The cost of getting the crop to the consumer exceeded materially the amount received by the producer. And yet certain essential services are performed between the grower's field and the consumer's table, and must be paid for. The producer and consumer can not perform these services or any appreciable portion of them, and consequently they fall to the lot of special agencies that have developed

[6] From a study of supply and price of lettuce in New York City, by the Port of New York Authority and the Bureau of Agricultural Economics.

[7] The effects of certain of these factors in New York City are being studied by the Bureau of Agricultural Economics in cooperation with the Port of New York Authority, in an effort to determine their relative importance in establishing the price level, so that the market may be forecast with reasonable accuracy under known conditions.

in response to the need. The margins of these middlemen are determined not only by the costs of the services rendered, but also by the risks assumed.

The country dealer is the connecting link between the grower and the city wholesaler. He performs the following functions:

1. Finances the grower by furnishing fertilizer and other essential supplies or cash. He usually finds it necessary to pay cash to the grower upon delivery because of the latter's need for prompt returns at time of harvesting.

2. Grades and packs the lettuce, unless this work is done by the grower prior to delivery.

3. Assembles and loads, consolidating into car lots smaller quantities obtained from several growers.

4. Sells and distributes the crop, searching out the demand and finding buyers either by wiring to established city market connec-

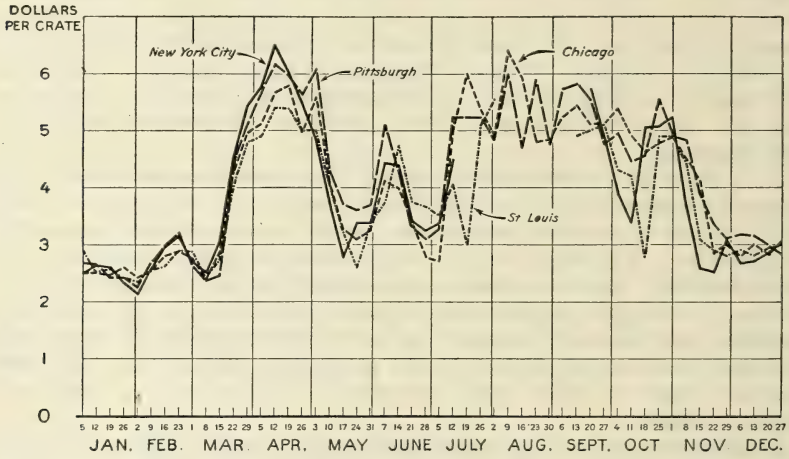

FIG. 21.—Jobbing prices in the large markets fluctuate with considerable uniformity

tions or through contact with traveling wholesale produce buyers at shipping point.

Transportation and refrigeration are essential features in the marketing of California lettuce. The crop must be transported from the district where it is produced to the populous areas where the demand for it exists. Lettuce is a commodity of considerable bulk and comparatively small value, and this is responsible in part for the relatively high transportation charges. The cost per unit of value is higher than it would be if a car of lettuce had greater worth. Furthermore, because of the perishable nature of the product, it must be protected from wilting and decay en route, and this necessitates shipment under refrigeration.

The high costs of freight and refrigeration, then, are due largely to the following: (1) Distance from the producing area to the consuming centers, (2) bulkiness of the commodity in relation to its intrinsic value, and (3) perishability of the commodity.

The task of searching out the demand and finding buyers among the retail trade is the duty of the city wholesaler or jobber. The

risks of marketing after arrival are likewise his. He maintains warehouse space and assembles shipments from different sources, thus keeping on hand adequate stocks so that the retailer is usually assured of fresh supplies continually in season, and is given the opportunity for selection of the quality, size, and quantity desired. He often extends credit to the retailer for short periods.

He receives car lots and breaks these up into smaller units for distribution, the retailer's requirements being anywhere from 1 crate up. He transfers the lettuce from car to warehouse, repairs packages damaged in transit, and displays the shipment for sale.

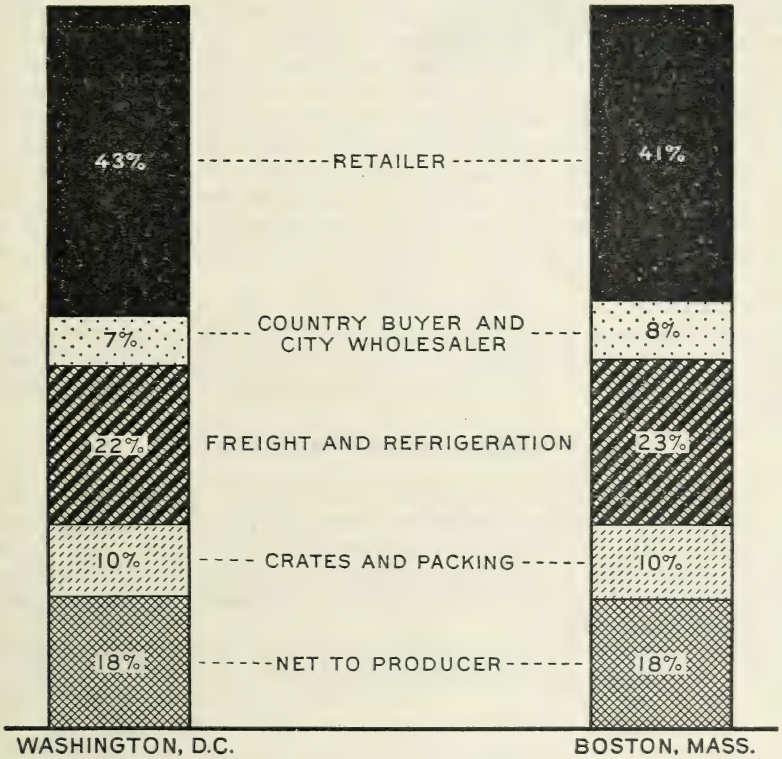

FIG. 22.—The cost of getting the crop to the consumer exceeds materially the amount received by the producer

As a rule he makes immediate settlement with the shipper at time of accepting the shipment.

Because of insufficient business and lack of storage space, retailers can not handle enough lettuce at one time to justify buying in car lots direct from the shipper. Further, the quality, size, and pack of a given shipment might not suit the requirements of the particular retailer to whom it was sent, since the consumer demands made on stores in different cities and even in different parts of the same city are far from identical, and these varied requirements are not known to the shipper. It is not likely that direct business relations

between shippers and retailers would be entirely satisfactory to either, inasmuch as retailers usually require an extension of credit by those from whom they buy, whereas the shipper needs prompt returns to enable him to continue paying cash to growers.

The consuming public demands from the retailer many types of service. They want the opportunity of choosing from a large variety of quality and size; they want constant fresh supplies, convenience of early opening and late closing hours, store locations which frequently involve high rentals, delivery of purchases, extension of credit, salesmen numerous enough to assure prompt service even in peak hours, etc. It appears that the size of the retailers' margin is determined not so much by large profits as by the high costs and large risks of our present highly competitive system of retail distribution. Usually the consumer will not accept, even at reduced prices, lettuce that has deteriorated materially in quality or condition so long as good lettuce may be had. Therefore, with such a perishable commodity, the retailer suffers a good deal of unavoidable waste and spoilage. He frequently finds it necessary to recondition some of the heads by trimming off defective outer leaves before offering them for sale, and in order to keep up the fresh appearance of his display, resorts to the same practice occasionally until sold. Some heads become a complete loss.

To maintain these services and to assume the risks accompanying the retail business manifestly requires a considerable portion of the price paid by the consumer. So long as the buying public insists upon this elaborate service, retail margins will doubtless remain large.

GENERAL SALES PRACTICES[9]

The different methods of selling employed by growers and shippers of lettuce may be classified as follows: (1) Direct consignment to commission merchants; (2) sales for cash either (*a*) before or during harvest, or (*b*) on track at shipping point; (3) delivered sales; (4) f. o. b. usual terms sales; (5) shipment on joint account; and (6) auction sales.

Definite figures are not available showing the proportion of the lettuce crop sold by each of these methods.

DIRECT CONSIGNMENT TO COMMISSION MERCHANTS

The consignment method is employed more or less in all lettuce sections, but is least common in those districts where the greatest advance has been made in standardized grading. It is also used to a greater extent when the market is weak than when it is active, because during periods of low or declining prices buyers usually feel less security in making outright purchases; consequently even those shippers who disapprove of this method of handling are sometimes forced to make use of it in order to find on outlet for all of their tonnage. The commission merchant, acting as agent for the

[9] For a more detailed discussion of distributing agencies and sales practices see Outlets and Methods of Sale for Shippers of Fruits and Vegetables, by J. W. Fisher, Jr., and J. H. Collins, Bulletin 266, and Methods of Wholesale Distribution of Fruits and Vegetables on Large Markets, by J. H. Collins and J. W. Fisher, Jr., Bulletin 267, of the United States Department of Agriculutre, 1915.

shipper, sells the lettuce in less than car lots, makes collections, and accounts to the shipper for all transactions. In making remittances after the goods have been disposed of he deducts freight and other expenses and retains for his services a stipulated percentage of the gross selling price of the shipment.

SALES FOR CASH

The small independent grower generally sells for cash if possible. He prefers immediate returns if the offer is reasonable, letting the buyer take the chances of profit or loss due to future price fluctuations. If he sells at cutting time or earlier, the probable yield may be estimated, the buyer offering a lump sum for the crop, or payment may be deferred until the packing is completed, at an agreed price per packed crate or hamper. Many of the cash transactions at shipping points, however, are "on track" sales. This means that the shipment is sold for cash at an agreed price free on board the car at shipping point, the buyer assuming all risks of damage in transit not caused by the seller. Such sales are usually made to the buyer or to his representative who actually examines and accepts the shipment at time of packing or loading.

DELIVERED SALES

Stock sold on a delivered basis is delivered by the seller on board the car, free of any and all charges for transportation or protective service, at the market in which the buyer is located or at such other market as agreed upon, the seller assuming all risks of damage in transit not traceable to the buyer. Payment may be made either before or after delivery, according to the terms of sale.

F. O. B. USUAL TERMS SALES

The amount of f. o. b. selling is said to be increasing gradually in those sections where the uniformity of the produce is dependable. Stock sold "f. o. b. usual terms" is sold at an agreed price loaded on the car at shipping point, but the buyer retains the privilege of inspection upon arrival before paying for the shipment. There usually is a price differential between "f. o. b. cash" sales and "f. o. b. usual terms" sales, ranging from a few cents up to 25 cents or more per package, this difference being due to the element of risk involved in selling f. o. b. usual terms. The rejection at destination of cars sold on this basis means added effort and expense to the shipper in disposing of them, and it is often necessary to reduce the price on rejected cars in order to resell them.

Cars frequently are rolled unsold when the f. o. b. market will not absorb them or when the shipper believes that by so doing he may obtain a higher net return. Even those shippers whose policy is to sell f. o. b. whenever possible, at times find it necessary to start cars to market unsold, hoping to dispose of these "rollers" en route. Such cars when sold in transit may be sold on either delivered or f. o. b. basis.

Financial advances are often made to growers by dealers or distributing firms to cover part of the cost of producing and preparing the crop for market. In consideration of this financial

assistance the grower agrees to deliver all or a stated part of his crop to be marketed by the firm furnishing the advance. This aid includes both supplies and money as needed, up to a stated limit which depends upon the growers' needs. The amount varies greatly, of course, but seldom exceeds 75 or 80 per cent of the entire cost of production, harvesting, packing, etc. The firm supplies packages and in most cases either pays the labor or sends its own harvesting and packing crews to do the work.

The firm retains all proceeds received from the sale of the crop until all advances have been paid. A brokerage is charged for all sales at shipping point or a commission in the case of consigned shipments. Most of these shipments are consigned, rolling to the terminal market connections of the firm making the advance.

SHIPMENT ON JOINT ACCOUNT

Frequently sales are made on what is known as a "joint account" basis. This term is commonly accepted as indicating an arrangement between a shipper and a terminal market distributor whereby each has some financial interest in the shipments and each contributes his knowledge of conditions, either at point of production or in the market, as the case may be. Profits or losses are shared in accordance with some stipulated proportion. The receiver usually advances a portion of the purchase price to the shipper under an agreement by which the latter draws on the receiver for a given amount per package at the time the car is loaded. The success of joint account agreements requires a thorough mutual understanding, as each is absolutely dependent upon the integrity of the other.

AUCTION SALES

Until recently very little lettuce was sold at auction. The delivered auctions located in a number of the large markets have confined their sales largely to citrus and deciduous fruits, almost to the exclusion of vegetables. There is a tendency among some of these companies at the present time, however, to undertake the sale of vegetables, and some shipments of lettuce have been sold in this way.

In 1923 two new auction companies were organized which have as their purpose the auctioning of car lots of fruits and vegetables by telegraph while the cars are still at the loading stations, in storage, or in transit. A substantial tonnage of lettuce has been sold by this method. Each company maintained salesrooms in several of the important markets, connected by a leased telegraph wire, the sales being conducted simultaneously in all the salesrooms. Cars are sold intact instead of being broken up into smaller lots as done by the delivered auctions. Each car offered is sold on the basis of its quality and condition as revealed by Government inspection at point of origin. Contents of the certificates of inspection are wired to the auction company each day prior to the sale.

Brokers as a rule do not act as direct receivers but represent the shippers in negotiating sales to car-lot buyers. Brokers often render valuable assistance in preventing unjustified rejections by unscrupulous buyers, or in procuring reasonable adjustments where rejections

are justified. It is not customary for them to make collections and remittances, as the shipper usually deals directly with the buyer after the sale is arranged. Brokers' charges are not based on selling prices but on the carload or package, and these charges vary with the sec tions and the type of package used.

In some sections it has become an established custom for commercial packers to act as sales agents for growers whose crops they pack. Commission is charged for this service.

COOPERATIVE MARKETING

In addition to the consignment solicitors, car-lot buyers and brokers who operate at shipping points, a number of growers' cooperative organizations have assumed a prominent place during recent years in the marketing of lettuce. In some States these organizations control a considerable percentage of the crop, and through collective and organized effort have effected savings and improved service in the marketing of the crop that would have been difficult if not impossible to attain through the voluntary efforts of unorganized growers and shippers. Cooperative marketing organizations, if properly organized and efficiently managed, can (1) standardize varieties and packages; (2) bring about improvements in grading, packing, and marking; (3) act as a clearing house for market information; (4) advertise the product effectively, thereby developing a wider distribution for the crop; and (5) purchase supplies for the members at a substantial saving. To be effective, a cooperative organization must control a sufficient tonnage to obtain the advantages of large-scale operations.

QUOTING PRICES

Quotations should always give complete and accurate information about the shipment. The kind of lettuce, the grade, the size, the number and kind of packages, and the probable date of shipment should be shown. A definite price quotation may be made, or bids may be solicited.

The standard rules and trade terms employed in the fruit and vegetable industry provide that a quotation of price is not strictly an offer to sell, but only an invitation for an order or an offer to buy, even though the party quoting actually owns or has the goods and makes the quotation in person. It is recommended that when a seller desires to solicit orders by quoting prices, he use the words "we quote" or "offer", and that when he intends to make a specific offer to sell to a definite buyer, he use the words "we will sell."

The shipper should prepay quotations by telegraph. The following form of message is suggested:

WILLIAMSON, N. Y., *July 18, 1924.*

BLACK FRUIT & VEGETABLE CO., *Pittsburgh, Pa.:*

We quote subject confirmation to-days shipment USONE Big. Boston lettuce two dozen crates dollar f. o. b.

JOHN DOE & CO.

The phrase "subject to confirmation" should always be used; otherwise acceptance results in a binding contract and the shipper would not be in position to select the best offer he has received. If

the price quoted is accepted or if a satisfactory offer is received, the shipper should wire immediately confirming the sale at the price named. If the car is loaded and ready for shipment this confirmation may be similar to the following:

WILLIAMSON, N. Y., *July 18, 1924.*

BLACK FRUIT & VEGETABLE CO., *Pittsburgh, Pa.:*

Shipped you to-day P. F. E. 31353 Pennsylvania delivery 432 crates USONE lettuce dollar f. o. b.

JOHN DOE & CO.

"To-days shipment" is accepted by the trade as meaning that the goods shall be under billing by the carrier before midnight of the day the order is given. "immediate shipment" permits of 24 hours longer, "quick shipment" 48 hours longer, and "prompt shipment" 72 hours longer than "to-day's shipment."

EFFECT OF BUSINESS METHODS ON SALE

Many marketing difficulties experienced by shippers result from their failure to observe accepted trade practices and good business methods. The shipper who misrepresents his offerings or fails to describe them accurately, who fails to confirm offers and quotations, who neglects to ship at the time specified, and who does not abide by his agreements, finds it increasingly difficult to transact business with buyers. The trade prefers to buy from shippers whose honesty and reliability are unquestioned, whose product is standardized, and whose sales policies and business methods conform to accepted trade customs.

FEDERAL SERVICES IN MARKETING

The important facts necessary in studying market conditions of any highly perishable commodity such as lettuce are:

(1) Knowledge of the daily supplies and expected arrivals in the large markets.

(2) The source of these supplies.

(3) Shipments day by day from each producing section.

(4) Production anticipated in each producing section.

(5) Quality and condition of stocks in producing sections and at terminal markets.

(6) Prices in producing sections and in terminal markets.

(7) Relationship of current supplies and prices with those of previous seasons.

(8) Relationship of supplies and prices of the commodity with those of competing commodities.

OUTLOOK REPORTS

Annual agricultural outlook reports are issued by the United States Department of Agriculture to provide a better base upon which farmers may make plans for the coming season. All important agricultural commodities, including lettuce, receive consideration in these reports. They are founded upon surveys of conditions affecting agricultural production and demand at home and abroad.

CROP REPORTING SERVICE

The Division of Crop and Livestock Estimates of the Bureau of Agricultural Economics disseminates crop and livestock estimates based upon data obtained from agricultural statisticians in the field and from voluntary crop reporters. The agricultural statistician in each State keeps in touch with the best-informed opinion on acreage and condition of the crops throughout his district by travel and by maintenance of a special corps of reporters, and renders periodic reports for his State. Of the voluntary correspondents, the county reporters submit reports regularly for their respective counties and the township reporters for their respective localities. Special lists of reporters are maintained for special inquiries. Reports from these independent sources are tabulated and summarized separately, and each is used as a check on the others.

MARKET NEWS SERVICE

The Bureau of Agricultural Economics also maintains a market news service covering the most important fruits and vegetables, including lettuce, with permanent offices in the important consuming and distributing centers and temporary field offices in the principal producing areas during the shipping season.[10] Daily market reports are issued by these offices, showing car-lot shipments made each day from the producing sections, destinations, diversions, arrivals, and supplies on the markets, the quality and condition of receipts, and prices paid in terminal markets and at points of origin. Figure 23 is a facsimile of one of these reports.

The reports are distributed free by mail upon request. Some large producers, dealers, and associations of growers receive reports by telegraph or telephone direct from the nearest field station by paying the cost of communication. They are also broadcast daily by numerous radio stations, to which the information is furnished by the market news offices. Many newspapers and farm periodicals carry either the daily reports or weekly summaries which are prepared for this purpose.

Field stations were operated by the Bureau of Agricultural Economics for the distribution of lettuce information during the 1924 season at El Centro, Los Angeles, and San Francisco, Calif., Portland, Oreg., Denver, Colo., Jacksonville, Fla., and Rochester, N. Y. Most of the permanent market stations in the large cities include lettuce information in their daily fruit and vegetable reports during periods of heavy receipts of this commodity.

A weekly publication of the United States Department of Agriculture at Washington, known as Crops and Markets, contains from time to time important information concerning the lettuce crop and markets.[11] This includes weekly market articles, prevailing price trends and ranges, crop reports, and estimates.

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[10] A more detailed discussion of this service is contained in United States Dept. of Agr. Yearbook Separate 797, How to Use Market Stations, by G. B. Fiske. Copies may be obtained from the United States Department of Agriculture, Washington, D. C. This article is also in United States Dept. of Agr. Yearbook, 1919 pp. 94–114.

[11] Crops and Markets may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at a cost of $1 per year.

MARKET NEWS SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

El Centro, Calif., January 19, 1924. Bureau of Agricultural Economics Barbara Worth Hotel, Telephone # 27.

LETTUCE NO. 11.

CARLOT SHIPMENTS REPORTED IN THE UNITED STATES FRIDAY JANUARY 18:
Arizona 14, Imperial Valley 90, Florida 26, Texas 1. TOTAL - - - - 131.

PRIMARY DESTINATIONS OF IMPERIAL VALLEY SHIPMENTS REPORTED FRIDAY JANUARY 18:

Boston	1	Buffalo	1	Butte	1	Chicago	20	Columbus	1
Davenport	1	DesMoines	1	Detroit	1	El Paso	19	Eugene	1
Fresno	1	Indpls.	1	Kan. City	9	L.Angeles	8	New York	3
Oakland	3	Ottumwa	1	Peoria	2	Phila.	1	Pittsburgh	2
Sacramento	2	St Joseph	1	S.Francisco	3	Seattle	1	Spokane	1
Toronto	2	Waco	2			TOTAL - - - - 90.			

ORIGINATIONS OF IMPERIAL VALLEY SHIPMENTS FRIDAY JANUARY 18:
Calipatria 2, Brawley 28, Imperial 5, El Centro 30, Heber 12, Calexico 15. Ttl-90.

CARS ORDERED IN THE IMPERIAL VALLEY FOR TODAY'S LOADING - 92.

COMPARISON OF SHIPMENTS AND IMPERIAL VALLEY PRICES JANUARY 18:

ORIGIN-	DAYS SHIPMENTS THIS YEAR	DAYS SHIPMENTS LAST YEAR	TOTAL TO DATE THIS YEAR	TOTAL TO DATE LAST YEAR	CARLOADS CASH TRACK THIS YEAR	CARLOADS CASH TRACK LAST YEAR
UNITED STATES -	131	118	6869	4657	-	-
IMPERIAL VALLEY -	90	80	1794	1328	$1.25-1.35	$2.15-2.25

DIVERSIONS REPORTED FOR CARS SHIPPED ON DATES SPECIFIED:
JAN.9: 1 Chicago to Wilkes Barre; 1 Houston to Kansas City. JAN.10: 1 Chicago to Boston. JAN.11: 1 Chicago to New York. JAN.12: 2 Kansas City to Dubuque Ia 1; Chicago 1; 1 Milwaukee to Chicago. JAN.13: 1 Kansas City to Cleveland; 1 Chicago to St Louis. JAN.14: 1 Kansas City to St Louis; 1 Chicago to Utica. JAN.15: 4 El Paso to Ft Worth 2, Oklahoma City 1, Kansas City 1; 1 San Antonio to Houston; 4 Chicago to Boston 1, New York 1, Pittsburgh 1, Jersey City 1. 3 Kansas City to Chicago 1, Philadelphia 1, Winnipeg 1; 1 Fresno to Salt Lake City. JAN.16: 11 Chicago to New York 5, Boston 1, Kansas City 1, Toronto 1, Schenectady 1, Jersey City 1, South Bend Ind 1; 3 Kansas City to Cincinnati 2, Springfield Mass 1; 6 El Paso to Ft Worth 1, Des Moines 1, Detroit 1, St Louis 1, Kansas City 1, Dallas 1 JAN.17: 10 Chicago to New York 5, Houston 1, Hutchinson 1, Jersey City 1, Buffalo 1. Toronto 1; 12 El Paso to Dallas 1, Des Moines 1, St Paul 1, Buffalo 1, Champaign Ill 1, Greenville SC 1, Ft Wayne Ind 1, Pittsburgh 1, Oklahoma City 1, New Haven 1, Houston 1, Louisville 1; 1 Philadelphia to Lincoln; 2 Kansas City to Springfield Ill Cleveland 1.

CHICAGO PASSINGS REPORTED FOR THE 24HR PERIOD ENDING 5:00 AM THIS MORNING:
Destined as follows - Albany 1, Cleveland 1, Canton O. 1, Washington 1, Grand Rapids 1, Providence 1, Baltimore 1, Jersey City 3, New York 4, Detroit 5, Boston 2.
NOTE: UNLESS OTHERWISE STATED, FOLLOWING QUOTATIONS ARE FOR ICEBERG TYPE OF GOOD MERCHANTABLE QUALITY AND CONDITION IN CALIFORNIA STYLE CRATES.

SHIPPING POINT INFORMATION FOR FRIDAY JANUARY 18:
EL CENTRO, CALIF: Demand slow, market weak, few sales. Carloads fob cash track - U.S. grade #1, 3s to 4s 1.25-1.35, mostly around 1.30. Many shipments rolled unsold. Cash to growers - mostly 60-65¢ per packed out crate.
TERMINAL F.O.B. AUCTION SALES FRIDAY, ALL CITIES: IMPERIAL VALLEY - 10 cars. U.S. grade #1, 1.15-1.37½; 2 cars, slightly frozen, soft bursted heads, 90-1.00.

TELEGRAPHIC REPORTS OF TODAY'S SALES TO JOBBERS, UNLESS OTHERWISE STATED

CHICAGO: 17° partly cloudy. 3 Ariz, 21 Calif, arrived, 62 on track. Demand moderate, trading moderate, market steady. IMP.VALLEY & ARIZ- 3⅛s-4½s 2.50-75; 3s 2.25-50; frozen, all sizes 2-2.25.
KANSAS CITY: 12° clear. 1 Ariz, 10 Calif, arrived, 4 diverted. 16 on track. Demand slow, market dull. CALIF- 2.75-3.00.
PITTSBURGH: 23° cloudy. 5 Ariz, 2 Calif, arrived. 49 on track. Supplies liberal. Demand very slow, market dull and weak. ARIZ CALIF- best 2.50-65, mostly 2.50, poorer, some decayed low as 2.00.
ST.LOUIS: 32° snowing. 1 Ariz, arrived. 14 on track. Supplies liberal. Demand slow, trading slow, market dull. CALIF- 3s - 4s 2.50-75.
CINCINNATI: 34° cloudy. 2 Ariz, 1 Calif, arrived, 14 on track. Supplies heavy. Demand slow, trading slow, market dull and weaker. ARIZ & CALIF- best 2.50.
DENVER: 9° partly cloudy. 2 Ariz, 2 Calif arrived. 6 on track. Supplies moderate. Demand moderate, trading limited, market about steady but slightly weaker feeling. IMP VALLEY- 4s mostly 2.75; 3⅛s mostly 2.50. ARIZ- 4s best 2.75, fair 2.25-50.
CLEVELAND: 31° snowing. 1 Ariz, 2 Calif, arrived. 10 on track. Too few sales to establish a market.
BOSTON: 37° clear. 1 Ariz, 3 Calif, 1 Fla, arrived. 6 on track but reported incomplete. Supplies liberal. Demand very slow, trading light. CALIF ARIZ- best few early sales 2.50
PHILADELPHIA: 36° cloudy. 2 Ariz, 2 Calif, 2 Fla, arrived. 25 on track. Supplies of western stock moderate. Demand limited, market steady. CALIF-IMP.VALLEY- few 2.50.
NEW YORK: 37° cloudy. 1 Ariz, 2 Calif, 9 Fla, arrived. Supplies of western stock light. Demand light, market steady. ARIZ CALIF- 2-2.75 few 3.00.
MINNEAPOLIS: 6° below, clear. No carlot arrivals. 15 on track. Supplies heavy. Demand slow, market steady. CALIFORNIAS - 3.00.

Released 11:20 AM

C. E. Schultz,
Local Representative.

FIG. 23.—Facsimile of lettuce market report issued by the Bureau of Agricultural Economics

With these sources of information at hand, the careful observer is enabled to keep in close touch with prevailing market conditions. They provide a substantial basis upon which to forecast the volume of tonnage from competing sections and the price trends in the various markets. They enable the shipper to determine with more or less accuracy when and where shipments may be sent for the best results, and to check up on returns for sales already made.

GOVERNMENT INSPECTION

The development of the Federal fruit and vegetable inspection service in the past few years has been of great benefit in promoting fair and equitable business relations between buyers and sellers. For several years the scope of this service was limited to shipments which had arrived in the terminal markets after moving in interstate commerce, but recently it was extended to include inspection at loading points. Lettuce shipments are now inspected and their quality and condition certified by Government inspectors at points of origin in several States. A certificate is reproduced in Figure 24.

One of the most noticeable and far-reaching results of this shipping-point inspection service has been the standardization of shipments originating in sections where the service is available. This service is exerting a large influence in keeping products of inferior quality out of the channels of trade, in addition to providing shippers with an official record that is recognized in all United States courts as prima facie evidence of the quality and condition of the products. It is resulting in better use of transportation, improved relationships between buyers and sellers, better distribution, lower cost of marketing, higher net returns to growers and shippers, and a higher grade of food to consumers. It is also tending to place the marketing of perishables on a point-of-origin basis. The popularity of the service is such that approximately 131,000 carloads of fruits and vegetables were inspected at shipping points from July 1, 1924, to June 30, 1925.[12]

SUMMARY

Lettuce is now an all-year product in most markets. The industry has grown marvelously during recent years, until in 1923 the crop ranked third among the vegetables in point of car lots shipped. It was exceeded only by potatoes and cabbage. In farm value lettuce ranked sixth. Car-lot shipments were more than 600 per cent as great as in 1916. The largest gains have been made in the Western States.

Ten States—Arizona, California, Colorado, Florida, Idaho, New Jersey, New York, North Carolina, South Carolina, and Washington—produce more than 97 per cent of the lettuce grown in the United States.

Almost the entire commercial crop is head lettuce. In the main Big Boston is grown in the Eastern and Southeastern States and the Iceberg type in the Western States. Leaf lettuce, of which Grand Rapids is the only variety of importance, is grown in green-

[12] Detailed information concerning the Government inspection of fresh fruits and vegetables may be obtained upon application to the Food Products Inspection Service, Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.

houses near some of the large cities in the East and Central West. It goes into local consumption principally.

Increasing production necessitates widened geographical distribution. Greater improvement in this regard has been made by west-

F. P. L.—20a

UNITED STATES DEPARTMENT OF AGRICULTURE

INSPECTION CERTIFICATE

S 90447

Inspection point Watsonville, Calif. *Billing point* Watsonville, Calif. *Date* 5/3/24

Applicant Blank Fruit Company *Address* Watsonville, Calif.

Shipper Same *Address* Same

I, the undersigned, on the date above specified made personal inspection of the lot of products herein described, and do hereby certify that the conditions, at the said time and on said date, pertaining to such products, were as stated below:

Car initial and number P. F. E. 17683 *Kind of car* Refrigerator

Car equipment and condition: At completion of inspection, 1.45, P.M. hatches closed, plugs in, bunkers full of ice, 5 inch false floor.

Products: Head L E T T U C E. Loader's count 320 crates, wax paper lined, with dozen count - 4, 4½ and 5 dozen, mostly 4 dozen, marked on ends. Crates stenciled "Blank Brand, Blank Fruit Co., Watsonville, Calif."

Loading: Loaded entire length of car, 4 layers high, 5 rows wide, each layer stripped. Approximately 6000 pounds lump ice over top of load.

Pack: Fairly tight to tight, with approximately 25 to 30 pounds crushed ice between layers.

Size: Fairly uniform and conforming to dozen count as marked.

Quality and condition: Lettuce generally firm to fairly firm, mostly firm, fresh, well trimmed, outer leaves of good green color. Approximately 6% of heads soft. In addition 2 to 3% of stock shows slight tipburn or slime. Stock otherwise practically free from defects.

Grade: Lettuce grades U. S. #1.

. Nielsen. *Inspector.*

PLEASE REFER TO THIS CERTIFICATE BY NUMBER

FIG. 24.—Facsimile of inspection certificate on a shipment of lettuce. Issued by the Bureau of Agricultural Economics

ern producing sections than by the eastern and southern districts.

The Iceberg type of lettuce meets with more favor than Big Boston in all large markets except New York, Philadelphia, and Boston, and even in these three is gaining in popularity, partly because of the general preference for crisp, compact heads of the Iceberg type and partly because this type usually has been graded

more carefully. There is a marked trend, however, toward improved grading and packing in the Eastern and Southern States that will doubtless go far to redeem Big Boston in the eyes of the trade and the consuming public.

Lettuce is packed in a variety of styles and sizes of containers, but there is a noticeable tendency toward standard packages. The hamper is losing popularity in the Southeastern States. Flat crates holding 2 dozen heads are used in the East and crates holding 3 to 6 dozen heads are used almost exclusively in the West. The markets show a preference for standard packages. The most desirable sizes of head lettuce pack 3½ to 4½ dozen in the large western crate, 2 dozen in the flat crate, and about 30 to 40 head in the 1½-bushel hamper.

Constant improvement is noticeable in the methods employed in preparing lettuce for market, and many individuals and organizations exercise scrupulous care in maintaining their high standards, yet the wide variation in the quality and condition of lettuce shipments that reach the terminal markets in the United States forces the conclusion that many shippers are still failing to devote as much attention to this phase of marketing as it deserves. In sections where standardized grades have been employed intelligently and consistently, and where approved methods of handling and selling are being followed, marketing conditions have shown a decided improvement.

Jobbing prices frequently show wide daily ranges, reflecting great variation in quality and condition of stocks offered. Prices often fluctuate sharply, slumping rapidly and recovering rapidly. These changes are more conspicuous in Big Boston prices than in Iceberg, because of greater uniformity in quality and condition of western supplies.

As a rule, in those markets where Big Boston is important, prices of the two types of head lettuce tend to parallel each other, with the Iceberg type usually outselling Big Boston for equivalent quantities.

Jobbing prices in the large markets fluctuate with considerable similarity, indicating that for the most part the factors having the strongest influence on price are general rather than local.

Essential services and risks involved in getting lettuce from the farm to the consumer's table are responsible for a large part of the spread between prices paid by consumers and those received by producers.

Business methods of shippers exert a great influence in determining the success or failure of their relationship with buyers. The trade prefers to transact business with reliable shippers whose product is dependable and whose sales policies and business methods conform to accepted trade practice. The shipper who earns the confidence and good will of the buying trade is possessed of a valuable asset.

Several important services in marketing are offered to buyers and sellers of lettuce by the United States Department of Agriculture. These consist of annual agricultural outlook reports, periodical crop reports of acreage and condition, daily market news reports covering all important markets and producing sections in season, and Government inspection at points of origin and in receiving markets.

STATE AND FEDERAL PUBLICATIONS ON HARVESTING AND MARKETING LETTUCE

STATE

California.

READ, F. W., and ROGERS, S. S. Growing and shipping California lettuce. Sacramento, 1922. Calif. Dept. Agr. Monthly Bul., vol. 11, no. 1, Jan. 1922, pp. 3–12; also Spec. Pub. 19.

ROGERS, S. S. Lettuce growing in California. Berkeley, 1917. Calif. Agr. Exp. Sta. Circ. 160. Harvesting and packing for shipment, pp. 12–16.

Colorado.

MCGINTY, R. A. Head lettuce in Colorado. Fort Collins, 1923. Colo. Agr. Exp. Sta. Bul. 283.

Idaho.

VINCENT, C. C. Growing head lettuce in Idaho. Moscow, 1922. Idaho Agr. Exp. Sta. Circ. 21. Harvesting and yields, pp. 9–11.

New Jersey.

HUBER, H. F. Lettuce growing in New Jersey. New Brunswick, 1924. N. J. Agr. Exp. Sta. Circ. 155. Harvesting, p. 20.

New York.

BONNEY, W. L. Lettuce; magnitude of the industry. Albany, 1918. N. Y. (State) Dept. of Farms and Markets. Agr. Bul., pp. 318–324.

UNDERWOOD, F. O. Grading, packing, and handling head lettuce in New York State. Ithaca, 1924. Cornell Univ. Col. Agr. Ext. Bul. 87. U. S. grades for head lettuce, p. 7.

South Carolina.

HARKEY, F L. South Carolina grades for head lettuce. Clemson College, 1922. Clemson Agr. Col. Ext. Circ. 43.

HARKEY, F. L., and Whitcombe, D. D. Commercial harvesting, grading, and marketing of lettuce in South Carolina. Clemson College, 1923. Clemson Agr. Col. Ext. Bul. 56.

Wyoming.

VASS, A. F. Rocky Mountain head lettuce. Laramie, 1923. Wyo. Agr. Exp. Sta. Circ. 19.

FEDERAL

BEATTIE, J. H. Lettuce growing in greenhouses. 1924. U. S. Dept. Agr. Farmers' Bul. 1418. Harvesting and packing, pp. 15–17.

DOWNING, F. P., and SPILMAN, H. A. Standard baskets for fruits and vegetables. 1924. U. S. Dept. Agr. Farmers' Bul. 1434. This bulletin supersedes Farmers' Bul. 1196, Standard containers for fruits and vegetables, by F. P. Downing.

RAMSEY, H. J., and MARKELL, E. L. Handling and precooling of Florida lettuce and celery. 1917. U. S. Dept. Agr. Bul. 601.

In addition to these bulletins the Bureau of Agricultural Economics of the United States Department of Agriculture issues mimeographed copies of the United States grades for lettuce. The bureau also issues at the end of each season summary reports of lettuce deals in various localties.

ORGANIZATION OF THE UNITED STATES DEPARTMENT OF AGRICULTURE

June 5, 1926

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This bulletin is a contribution from

Bureau of Agricultural Economics	THOMAS P. COOPER, *Chief.*
Division of Fruits and Vegetables	WELLS A. SHERMAN, *Chief Marketing Specialist, in charge.*

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